Appendix A
The Delta Stewardship Council's Role Regarding Conveyance

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Appendix A: The Delta Stewardship Council's Role Regarding Conveyance

The Delta Reform Act potentially gives the Council three distinct but connected roles relating to conveyance: contingent authority to approve proposed conveyance improvements, authority to generally recommend conveyance options in the Delta Plan, and authority to provide comments to other agencies during the Bay Delta Conservation Plan (BDCP) process.[1]

Regulatory Authority over Conveyance

As a practical matter, the Council would have occasion to decide in the first instance what conveyance improvements are permissible only if (a) an agency proposes a conveyance improvement prior to the incorporation of the Bay Delta Conservation Plan into the Delta Plan, (b) the proposed conveyance improvement is a "covered action" under Water Code section 85057.5, and (c) the proposed conveyance improvement, as a covered action, is appealed to the Council as not being consistent with the Delta Plan. For reasons explained below, it is unlikely that an agency will propose a conveyance improvement prior to the completion of (or the failure of) the BDCP process. Accordingly, it would be wasteful now to include in the Delta Plan regulatory Policies prescribing/limiting conveyance. If events in subsequent years reveal that BDCP will not be successful in a timely fashion, the Council will consider then whether to amend the Delta Plan to prescribe conveyance.

The Delta Reform Act mandates that the Council's Delta Plan "promote options" for improving conveyance and storage to meet the coequal goals (Water Code section 85303). Thus, the Council has the authority to dictate in the Delta Plan conveyance improvements it views as meeting the coequal goals. In addition, proposed conveyance improvements that are "covered actions"[2] under the Act must be consistent with the Delta Plan,[3] and the Council determines (upon appeal) consistency.[4] Through specifying conveyance improvements in the Delta Plan (should the Council do so), the consistency requirement, and the Council's appellate role over consistency determinations, the Council has the authority to regulate conveyance improvements.

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[1] This is an attempt to summarize the Council's relationship with BDCP and conveyance for the purpose of clarity. However, it does not purport to summarize the Council's complete authority in this regard. The Council retains all authority provided to it under the Delta Reform Act.

[2] Proposed conveyance improvements would almost certainly be a covered action: Such a project would (1) be a CEQA project; (2) occur at least in part within the Delta; (3) be carried out, approved, or funded by a public agency; (4) would be covered by one or more provisions of the Delta Plan; and (5) have a significant impact on the coequal goals (Water Code section 85057.5.).

[3] An agency proposing a conveyance covered action would have to certify that the project is consistent with the Delta Plan (Water Code section 85225).

[4] The Council would review this consistency determination if and when it was appealed to the Council (Water Code section 85225.10; Council's Appeals Procedures).

This is best viewed as *contingent* regulatory authority. The Council may never get to exercise it. Most relevant and as a practical matter, occasion to exercise that authority is contingent in the near term on BDCP.

Conveyance options are currently being studied *in detail* by the agencies and interested parties preparing the BDCP. A public draft of the BDCP Environmental Impact Statement/Environmental Impact Report is planned for release by the end of 2011. Upon successful completion of the BDCP process, and if BDCP meets certain requirements explained in Water Code section 85320(e), BDCP becomes part of the Delta Plan.[5] Subsequently, if another government agency (Department of Water Resources, most likely) proposes to implement the new conveyance project that is selected by BDCP as the preferred conveyance option and that project qualifies as a "covered action" (it would qualify, most likely), the project would be consistent with the Delta Plan regardless of whether the Delta Plan had previously endorsed a different conveyance option. Accordingly, the Council's regulatory authority over conveyance is contingent upon conveyance being proposed prior to BDCP's incorporation into the Delta Plan.

It is highly unlikely that a conveyance proposal will come before the Council prior to BDCP completion, or at least the anticipated deadline for BDCP completion. The Council considers it highly unlikely that an agency will propose a new conveyance facility while BDCP is underway. Accordingly, the Council does not expect to review a conveyance improvement consistency determination separate from BDCP unless the BDCP process fails.

For this reason, the 2012 Delta Plan does not include any regulatory Policies regarding conveyance. In addition, BDCP has been underway since 2006, and in the last 5 years, the involved agencies and interested parties have invested significant time, resources, and expertise in that process. The lead agencies of BDCP will also be conducting extensive environmental analysis of the various conveyance alternatives they consider. The Council has determined that the best option at this point is to encourage the lead agencies of BDCP to complete their work in short order. It would be a wasteful and duplicative exercise for the Council *now* to include a regulatory policy regarding conveyance. Doing so would require the same extensive policy, scientific, and environmental analysis BDCP is already doing.

However, should the BDCP process not be completed by January 1, 2014, the Council intends to revisit the issue of conveyance to determine how to facilitate improved conveyance facilities without BDCP. If the Council then decides to amend the Delta Plan to include regulatory Policies regarding conveyance, the Council would do so only after extensive analysis of the conveyance options and associated detailed environmental review. Accordingly, the Delta Plan includes the following policy.

Authority to Recommend Options

Implicit in the Council's regulatory authority relating to conveyance (that the Delta Plan shall promote options for improving conveyance) (Water Code section 85304) is its authority to recommend to other agencies conveyance options it views as meeting the coequal goals. This authority can be exercised through making Recommendations about conveyance in the Delta Plan.

The Act, therefore, gives the Council the authority to opine generally about improving conveyance as it may relate to the rest of the Delta Plan and the coequal goals. Accordingly, the Council has authority to recommend to BDCP preferred conveyance options BDCP should evaluate. Nevertheless, for the same reasons the Delta Plan at this time does not include any regulatory Policies regarding conveyance, the Delta Plan likewise does not include any Recommendations (*i.e.,* opinion preferences) regarding

[5] The Department of Fish and Game's decision that BDCP meets the requirements for incorporation into the Delta Plan may be appealed to the Council under Water Code section 85320(e).

conveyance. At this time, the agencies pursuing BDCP are best positioned to develop possible options, evaluate them, and decide on the best one.

Authority to Provide Comment during the BDCP Process

The Delta Reform Act provides the Council with a consultative and responsible agency role in the BDCP process (Water Code section 85320(c).). Thus, the Council may, separate from the Delta Plan, provide comment and guidance to lead agencies regarding BDCP, including the conveyance options those agencies consider, study, and ultimately choose.

Appendix B

I. Administrative Procedures Governing Appeals
II. Statutory Provisions Requiring Other Consistency Reviews
III. Other Forms of Review or Evaluation by the Council

[ADOPTED 9/23/2010]

DELTA STEWARDSHIP COUNCIL

I. ADMINISTRATIVE PROCEDURES GOVERNING APPEALS
II. STATUTORY PROVISIONS REQUIRING OTHER CONSISTENCY REVIEWS
III. OTHER FORMS OF REVIEW OR EVALUATION BY THE COUNCIL

PART I- ADMINISTRATIVE PROCEDURES GOVERNING APPEALS

Introduction

1. Purpose. These administrative procedures govern how the Delta Stewardship Council considers appeals with regard to:

a) Adequacy of certifications of consistency with the Delta Plan submitted to the council by a state or local public agency pursuant to Water Code sections 85225.10 and 85225.30; and

b) Determinations by the Department of Fish and Game that the Bay Delta Conservation Plan has met the requirements of Water Code section 85320 for inclusion in the Delta Plan.

NOTE: Authority cited: Water Code sections 85001, 85020(h), 85022, 85057.5, 85200, 85210, 85212, 85225, 85225.5, 85225.10, 85225.15, 85225.20, 85225.25, 85225.30, 85300, 85320(e).

Review of certifications of consistency with Delta Plan

2. Any state or local public agency proposing to undertake a covered action, as defined in Water Code section 85057.5 is encouraged to consult with the council at the earliest possible opportunity, preferably no later than 30 days before submitting its certification to the council pursuant to Water Code section 85225, to ensure that the project will be consistent with the Delta Plan. The council's staff will meet with the agency's staff to review the consistency of the proposed action and to make recommendations, as appropriate. During this early consultation, the agency's staff may also seek clarification on whether the proposed project is a "covered action"; provided that the ultimate determination on whether it is a covered action shall be made by the agency, subject to judicial review.

NOTE: Authority cited: Water Code sections 85212, 85225, 85225.5, 85225.30.

3. At least 10 days prior to its submission of a certification to the council, a state or local public agency that is not subject to open meeting laws (that is, the Bagley-Keene Open Meeting Act [Gov.Code sec.11120 et seq.] or the Brown Act [Gov.Code sec.54950 et seq.]) with regard to its certification, shall post, for public review and comment, its draft certification conspicuously on its website and in its office, mail it to all persons requesting notice, and include any public comments received in the record submitted to the council in the case of an appeal. A state or local public agency that is subject to open meeting laws with regard to its certification is encouraged to take those actions.

NOTE: Authority cited: Water Code sections 85225, 85225.30.

4. a) Any certification of consistency filed by a state or local agency pursuant to Water Code section 85225 shall set forth detailed findings that the covered action is consistent with the Delta Plan. The council shall prepare a checklist that agencies may use to assist them in preparing the certification and making the required findings.

b) A state or local agency shall submit to the council, no later than 10 days after receiving notice of an appeal pursuant to Paragraph 8, the record that was before the state or local agency at the time it made its certification, including a table of contents of documents contained therein and a brief chronology of events and actions relevant to the covered action. The record shall be certified by the state or local agency as being "full and complete." Given the tight, statutory deadlines for hearing and deciding appeals, a state or local agency is nevertheless strongly encouraged to submit the record at the time it files its certification of consistency, to ensure the opportunity for thorough review by the council in the event of an appeal.

c) The failure by a state or local agency to submit the record to the council on a timely basis as required by subparagraph (b), shall be grounds for the council to affirm the appeal on the basis that there was not substantial evidence presented to support the certification of consistency.

d) Any filings required by this Paragraph (4) shall be submitted in electronic form to facilitate availability and public access, and shall be public records.

NOTE: Authority cited: Water Code sections 85225, 85225.30.

5. Any person, including any member of the council or its executive officer, who claims that a proposed covered action is inconsistent with the Delta Plan and, as a result of that inconsistency, that action will have a significant adverse impact on the achievement of one or both of the goals of the Act or implementation of government sponsored flood control programs to reduce risks to people and property in the Delta, may file an appeal with regard to a certification of consistency submitted to the council no later than 30 calendar days after that submittal.

NOTE: Authority cited: Water Code sections 85225.10 (a), 85225.15, 85225.30.

6. The appeal shall clearly and specifically set forth the basis for the claim that the covered action is inconsistent with the Delta Plan. The appeal shall be in writing and set forth the following information:

a) Appellant's name and address;

b) The name and address of the party, if any, whose proposal is the subject of the appeal;

c) A description of the covered action that is the subject of the state or local public agency certification;

d) The identity of the state or local government body whose certification is being appealed;

e) The specific grounds for appeal; and

f) A detailed statement of facts on which the appeal is based.

The appeal shall be filed in electronic form.

NOTE: Authority cited: Water Code sections 85225.10 (b), 85225.30.

7. The appeal shall be considered "filed" with the council when the appellant's appeal is received, determined by staff to contain all of the information listed in Paragraph 6, and a hard-copy is printed and stamped "Filed" by the council staff with the date of filing indicated.

NOTE: Authority cited: Water Code sections 85225.10, 85225.20, 85225.30.

8. Within five working days of the filing of an appeal with the council, the executive officer shall:

a) Post a notice and brief description of the appeal and its effective date in a conspicuous location in the council's office and on its website;

b) Mail to the affected state or local public agency and to any third party whose proposal is the subject of the certification, a copy of the notice and a brief description, with a copy of the appeal documents filed with the council;

c) Mail copies of the appeal to each member of the council, and to the Delta Protection Commission for informational purposes consistent with Public Resources Code section 29773; and

d) Mail notice to the appellant that the appeal has been filed and stating the effective date of filing.

NOTE: Authority cited: Water Code sections 85225.30.

9. The council or its executive officer may request from the appellant further information necessary to clarify, amplify, correct, or otherwise supplement the information submitted with the appeal, within a reasonable period. The council or by delegation its executive officer may dismiss the appeal for failure of the appellant to provide information requested within the period provided, if the information requested is in the possession of or under the control of the appellant.

NOTE: Authority cited: Water Code sections 85225.10, 85225.20, 85225.25, 85225.30.

10. The council or its executive officer may supplement the record submitted by the state or local agency if the council or its executive officer determines that additional information was part of the record before the agency, but was not included in the agency's submission to the council.

NOTE: Authority cited: Water Code sections 85225.10, 85225.20, 85225.25, 85225.30.

11. The appellant, the state or local agency, the Delta Protection Commission, or any other person may testify before the council regarding an appeal. Presentations may be oral or in writing, shall address only whether the record supports the certification of consistency, and shall be as brief as possible. Written submissions should be provided to the council at least 10 days prior to the hearing to ensure that they, or in appropriate cases, summaries, may be circulated to council members for their review ahead of the hearing. The council's presiding officer may establish reasonable time limits for presentations.

NOTE: Authority cited: Water Code sections 85225.10, 85225.20, 85225.25, 85225.30.

12. All written submissions to the council may be in electronic form.

NOTE: Authority cited: Water Code section 85225.30.

13. The council shall hear all appeals of certifications of consistency filed pursuant to Water Code section 85225 within 60 days of filing unless:

a) The parties agree to a reasonable extension approved by the executive officer, taking into account the circumstances of the matter subject to appeal and the council's hearing schedule and associated workload, or

b) The council, or by delegation its executive officer, determines that the issue raised on appeal is not within the council's jurisdiction or does not raise an appealable issue.

NOTE: Authority cited: Water Code sections 85225, 85225.20, 85225.30.

14. The council shall make its decision on the appeal within 60 days of hearing the appeal, and shall make specific written findings defining the covered action under review and either denying the appeal or remanding the matter to the state or local public agency for reconsideration of the covered action based on the finding that the certification of consistency is not supported by substantial evidence in the record before the state or local public agency that filed the certification.

NOTE: Authority cited: Water Code sections 85225.20, 85225.25, 85225.30.

15. No covered action which is the subject of an appeal shall be implemented unless one of the following conditions has been met:

a) The council has denied the appeal;

b) The public agency has pursuant to Water Code section 85225.5 decided to proceed with the action as proposed or modified and has filed with the council a revised certification of consistency addressing each of the findings made by the council, 30 days has elapsed and no person has appealed the revised certification; or

c) The council or its executive officer has dismissed the appeal for one or both of the following reasons:

1. The appellant has failed to provide information in her possession or under her control within the time requested or
2. The issue raised is not within the council's jurisdiction or fails to raise an appealable issue.

NOTE: Authority cited: Water Code sections 85225.5, 85225.25, 85225.30.

Review of Bay Delta Conservation Plan

16. If the Department of Fish and Game (department) determines that the Bay Delta Conservation Plan (BDCP) referred to in Water Code section 85053 meets all of the requirements of Water Code section 85320 for inclusion in the Delta Plan, it shall file the BDCP and its determination with the council.

NOTE: Authority cited: Water Code sections 85053, 85225.30, 85320.

17. Upon receipt of the department's determination, the executive officer of the council shall:

a) Post a notice and brief description of the BDCP, the department's determination, the date of filing and the right of any person to appeal that determination on its website and in a conspicuous location in the council's office;

b) Mail a notice and brief description of the BDCP, the department's determination and the right of appeal to any person requesting notice; and

c) Mail copies of the determination to each member of the council.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (e).

18. Any person, including any member of the council or its executive officer, may appeal to the council the determination of the department that the BDCP meets all of the requirements of Water Code section 85320 for inclusion in the Delta Plan.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (e).

19. a) Any appeal to the council made pursuant to Paragraph 18 shall be made within 30 days of the later of the following:

1. the filing with the council of the department's determination that the BDCP meets all the requirements of Water Code section 85320 for inclusion in the Delta Plan, or
2. the conclusion of the council's hearing or hearings held pursuant to Water Code section 85320(d).

b) The appeal shall be in writing and filed in electronic form. It shall clearly set forth the specific grounds for the appeal and the specific facts upon which it is based. These shall include a list of each specific requirement of Water Code section 85320 that the BDCP allegedly fails to meet. The appeal shall be considered filed with the council when the appellant's appeal is received, determined by staff to contain all the information required in this paragraph, and a hard-copy is printed and stamped "Filed" by the council staff with the date of filing indicated.

c) If an appeal is filed before the council publicly notices a hearing to be held pursuant to Water Code section 85320(d), the council, in its discretion, may combine the hearing on appeal and the hearing pursuant to Water Code section 85320(d).

NOTE: Authority cited: Water Code sections 85225.30, 85320.

20. Within five working days of the filing of an appeal pursuant to Paragraph 18, the executive director shall:

a) Post a notice and brief description of the appeal on its website and in a conspicuous location in the council's office;

b) Mail a notice and brief description of the appeal to any person requesting copies of such appeals; and

c) Mail copies of the appeal and a brief description of the appeal to each member of the council.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (e).

21. The council or its executive officer may request from the appellant or the department additional information necessary to clarify, amplify, correct, or supplement the information submitted with the appeal within a reasonable period.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (e).

22. Any appeal made pursuant to Paragraph 18 may be dismissed if the council or its executive officer determines that it does not raise an appealable issue or if the appellant has failed to provide requested information to support her charge within a reasonable time, if that information is in the possession of or under the control of the appellant.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (e).

23. The council shall determine, based upon a preponderance of the evidence, whether the department correctly determined that the BDCP meets all of the requirements of Water Code section 85320 for inclusion in the Delta Plan. In reaching its decision, the council shall give weight to the reasoning and factual findings of the department. The council may seek clarification from the department of its reasoning and factual findings prior to the council making its final determination.

NOTE: Authority cited: Water Code section 85225.30, 85320(b), (e).

23.5 a) The council shall conduct any hearing on an appeal made pursuant to Paragraph 18 in a manner deemed most suitable to ensure fundamental fairness to all parties concerned, and with a view toward securing all relevant information and material necessary to render a decision without unreasonable delay.

b) The hearing need not be conducted according to technical rules relating to evidence and witnesses. Any relevant evidence shall be considered if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs, regardless of the existence of any common law or statutory rule which might make improper the admission of such evidence over objection in a court proceeding.

Unduly repetitious or irrelevant evidence shall be excluded upon order of the council or its chairperson.

c) Subject to Paragraph 23, evidence before the council includes, but is not limited to, the record before the department. The record will not include a transcript of any proceedings before the department unless provided by a party to the proceedings or requested by the council.

d) Any interested person may testify before the council regarding an appeal concerning the BDCP. Speakers' presentations shall be to the point and shall be as brief as possible. Visual and other materials may be used as appropriate. The council may establish reasonable time limits for presentations; such time limits shall be made known to all affected persons prior to any hearing. Where speakers use or submit to the council visual or other materials, such materials shall become part of the hearing record and shall be identified and maintained as such. Speakers may substitute reproductions of models or other large materials but shall agree to make the originals available upon request of the executive director.

e) Council members may ask questions of the appellant, the department's representative(s), any third party appearing at the hearing or staff. Questioning of speakers at the hearing by other persons shall not be permitted except by permission of the Chairperson.

f) Interested persons may submit written comments concerning an appeal. Any such comments will be considered by the council if they are received by the council at or before the hearing on the appeal; provided that those written comments should be submitted to the council at least 10 days prior to the hearing to ensure that they, or in appropriate cases, summaries, may be circulated to council members for their review ahead of the hearing.

g) The council may continue the hearing where it determines that a continuance would be appropriate.

NOTE: Authority cited: Water Code sections 85225.30, 85320(e).

24. The council's decision shall include specific written findings. The council shall post its decision on its website and mail copies to the department and all parties requesting notice.

NOTE: Authority cited: Water Code sections 85225.30, 85320(e).

25. If the council decides that the department incorrectly determined that the BDCP meets all of the requirements of section 85320 for inclusion in the Delta Plan, and consequently grants the appeal, the department may revise its determination to meet the issues raised by the council, or may respond to the council's findings in detail, setting forth reasons why it has concluded that the BDCP meets all of the requirements of

section 85320 for inclusion in the Delta Plan. Unless the council decides that the department's determination, as submitted or revised, correctly concludes that the BDCP meets all of the requirements of section 85320 for inclusion in the Delta Plan, the BDCP shall not be incorporated in the Delta Plan and the public benefits associated with the BDCP shall not be eligible for state funding.

NOTE: Authority cited: Water Code sections 85225.30, 85320 (a), (b), (e).

Ex Parte Contact Restrictions Applicable to All Appeals

26. Hearings on appeals are subject to the ex parte communication restrictions of California Administrative Procedures Act (Gov. Code § 11430.10 et seq.). Under that Act, an ex parte communication is a "communication, direct or indirect, regarding any issue in the proceeding, to the [council or council member] from an employee or representative of an agency that is a party or from an interested person outside the agency, without notice and opportunity for all parties to participate in the communication." (Gov. Code § 11430.10.) The restrictions apply from the date that the appeal is filed to the date that the council reaches a final decision on the appeal.

NOTE: Authority cited: Government Code sections 11430.10, 11430.80, Water Code section 85225.30.

27. To ensure compliance with these provisions, members should avoid ex parte communications while an appeal is pending. If they nevertheless receive one, such as by an individual sending a letter to a member concerning a pending matter, the member should notify the council's legal adviser or executive officer so that appropriate measures can be taken.

NOTE: Authority cited: Government Code sections 11430.10, 11430.80, Water Code section 85225.30.

28. At the first appropriate meeting after an appeal is anticipated or filed, the council's legal adviser will remind the council of this restriction and answer questions about its scope.

NOTE: Authority cited: Government Code sections 11430.10, 11430.80, Water Code section 85225.30.

Official Notice

29. Notwithstanding any provision of these procedures to the contrary, the council may take official notice in any hearing that it conducts, of any generally accepted technical or scientific matter within the council's jurisdiction, and of any fact that may be judicially noticed by the courts of this State.

NOTE: Authority cited: Government Code section 11515, Water Code section 85225.30.

Filings and Mailings

30. All filings and mailings required by sections 1-29 of these procedures may be made electronically.

NOTE: Authority cited: Water Code section 85225.30.

Consolidation of Appeals

31. The council, at its discretion, may consolidate appeals raising similar issues.

NOTE: Authority cited: Water Code section 85225.30.

PART II—STATUTORY PROVISIONS REQUIRING OTHER CONSISTENCY REVIEWS (AFTER ADOPTION OF THE DELTA PLAN)

In several other sections of SB X7 1, the council is directed to review for consistency with the Delta Plan, various plans of specified public agencies. This Part is directed at those reviews, which fall outside the scope of the procedures covered by Part I.

1. Delta Protection Commission's Economic Sustainability Plan.

Public Resources Code section 29759 requires the Delta Protection Commission (DPC), by July 1, 2011, to adopt an economic sustainability plan. That plan must include information and recommendations that inform the council's policies regarding the socioeconomic sustainability of the Delta's region.

Public Resources Code section 29761.5(b) requires the DPC to transmit copies of the plan to the council within 60 days of adoption. The council is required, within 180 days of the adoption of the plan, to review the plan for consistency with the Delta Plan.

2. Local and Regional Planning Documents.

Water Code section 85057.5(b)(3), excepts from the definition of "covered action", regional transportation plans prepared pursuant to Government Code section 65080.

Paragraph (4) of that same section, excepts from the definition of "covered action", plans, programs, projects or activities within the secondary zone of the Delta that the applicable metropolitan planning organization under Government Code section 65080 has determined is consistent with either a sustainable communities strategy or an alternative planning strategy that would achieve specified greenhouse gas emission reduction targets as determined by the Air Resources Board.

Because they are not "covered actions", these types of local and regional planning documents are not subject to the statutory provisions governing consistency of state and local public agency actions (Water Code secs. 85225 et seq.), or the council's Administrative Procedures Governing Appeals (Part I, above), with one exception noted in paragraph (d), below.

However, Water Code section 85212 provides a separate requirement and process for consistency review by the council of these types of local and regional planning documents.

In particular:

(a) The council is required to review and provide timely advice to local and regional planning agencies regarding the consistency of local and regional planning documents, including sustainable communities strategies and alternative planning strategies prepared pursuant to Government Code section 65080, with the Delta Plan.

(b)The council's input must include, but not be limited to, reviewing the consistency of local and regional planning documents with the ecosystem restoration needs of the Delta and reviewing whether the lands set aside for natural resources protection are sufficient to meet the Delta's ecosystem needs.

(c) A metropolitan planning organization preparing a regional transportation plan that includes land within the primary or secondary zones of the Delta must consult with the council early in the planning process regarding the issues and policy choices relating to the council's advice.

(d) No later than 60 days prior to the adoption of a final regional transportation plan, the metropolitan planning organization must provide the council with a draft sustainable communities strategy and an alternative planning strategy, if any. Concurrently, the metropolitan planning organization must provide notice of its submission to the council in the same manner in which agencies file a certificate of consistency with regard to covered actions.

(e) If the council concludes that the draft strategies are inconsistent with the Delta Plan, the council must provide written notice of the claimed inconsistency to the metropolitan planning organization no later than 30 days prior to the adoption of the final regional transportation plan.

(f) If the council provides timely notice of a claimed inconsistency, the metropolitan planning organization's adoption of the final regional transportation plan must include a detailed response to the council's notice.

PART III--OTHER FORMS OF REVIEW OR EVALUATION BY THE COUNCIL

1. Interested parties, including federal, state and local public agencies, are encouraged to confer with the council or its executive officer over the scope and potential impacts of the interim plan developed under Water Code section 85084. Interested parties will be provided an opportunity to comment and provide input on the interim plan as it is developed.

2. Similarly, prior to adoption of the Delta Plan, project proponents are encouraged to consult with the council or its executive officer early in the planning stages of projects that may constitute "covered actions" under Water Code section 85057.5 once the Delta Plan is adopted. Subject to available resources, the council may review and comment on planning documents and environmental review documents regarding potential "covered actions".

3. Subject to available resources, the executive officer or his designee may meet with interested parties, upon their request, to help mediate relevant disputes, including disputes, once the Delta Plan is adopted, over whether a project constitutes a "covered action" under Water Code section 85057.5. The intent of this mediation will be to provide an objective and informal forum for dispute resolution that will serve as a more efficient alternative to costly and time- consuming litigation.

4. Interested parties, including federal, state and local agencies, are encouraged to confer and coordinate with the council or its executive officer with regard to agency plans, studies, strategies, and recommendations required, or otherwise suggested, to be considered by the council for incorporation into the Delta Plan.

Appendix C
Select DWR Policies Regarding Contract Negotiations and Water Transfers

Appendix C1
Policy 03-09: Principles Regarding Public Participation Process in State Water Project Contract Negotiations

STATE OF CALIFORNIA • RESOURCES AGENCY • DEPARTMENT OF WATER RESOURCES

NOTICE TO

STATE WATER PROJECT CONTRACTORS

NUMBER: 03-09

DATE: 7/3/03

SUBJECT: Guidelines for Review of Proposed Permanent Transfers of State Water Project Annual Table A Amounts

FROM: INTERIM DIRECTOR, DEPARTMENT OF WATER RESOURCES

The Department of Water Resources is issuing the following guidelines prepared in connection with the Settlement Agreement, dated May 5, 2003, reached in *Planning and Conservation League et al. v. Department of Water Resources, 83 Cal. App. 4th 892 (2000).* These guidelines are effective upon the superior court's approval of the Settlement Agreement on May 20, 2003.

1. Purpose: The purpose of these guidelines is to describe the process for DWR's review of proposed permanent transfers of State Water Project Annual Table A Amounts and, by so doing, provide disclosure to SWP contractors and to the public of DWR's process and policy for approving permanent transfer of SWP Annual Table A Amounts. Such disclosure should assist contractors in developing their transfer proposals and obtaining DWR review expeditiously, and assist the public in participating in that review.

2. Coverage: These guidelines will apply to DWR's approval of proposed permanent transfers of water among existing SWP contractors and, if and when appropriate, to proposed permanent transfers of water from an existing SWP contractor to a new SWP contractor.

3. Interpretation: These guidelines are in furtherance of the State policy in favor of voluntary water transfers and shall be interpreted consistent with the law, including but not limited to Water Code Section 109, the Burns-Porter Act, the Central Valley Project Act, the California Environmental Quality Act, area of origin laws, the public trust doctrine, and with existing contracts and bond covenants. These guidelines are not intended to change or augment existing law.

4. Revisions: Revisions may be made to these guidelines as necessary to meet changed circumstances, changes in the law or long-term water supply contracts, or to address conditions unanticipated when the guidelines are adopted. Revisions shall be in accordance with the Settlement Agreement.

5. Distribution: The transfer guidelines shall be published by DWR in the next available edition of Bulletin 132, and also as part of the biennial disclosure of SWP reliability as described in the Settlement Agreement.

6. Contract Amendment: Permanent transfers of SWP water are accomplished by amendment of each participating contractor's long-term water supply contract. The amendment consists of amending the Table A upwards for a buying contractor and downwards for a selling contractor. The amendment shall be in conformity with all provisions of the long-term water supply contracts, applicable laws, and bond covenants. Other issues to be addressed in the contract amendment will be subject to negotiation among DWR and the two participating contractors. The negotiations will be conducted in public, pursuant to the Settlement Agreement and Notice to State Water Project Contractors Number 03-10.

7. Financial Issues: The purchasing contractor must demonstrate to DWR's satisfaction that it has the financial ability to assume payments associated with the transferred water. If the purchasing entity was not a SWP contractor as of 2001, special financial requirements pertain as described below, as well as additional qualifications.

8. Compliance with CEQA: Consistent with CEQA, the State's policy to preserve and enhance environmental quality will guide DWR's consideration of transfer proposals (Public Resources Code Section 21000). Identification of the appropriate lead agency will be based on CEQA, the CEQA Guidelines, and applicable case law, including *PCL v. DWR.* CEQA requires the lead agency at a minimum to address the feasible alternatives to the proposed transfer and its potentially significant environmental impacts (1) in the selling contractor's service area; (2) in the buying contractor's service area; (3) on SWP facilities and operations; and (4) on the Delta and areas of origin and other regions as appropriate. Impacts that may occur outside of the transferring SWP contractors' service areas and on fish and wildlife shall be included in the environmental analysis. DWR will not approve a transfer proposal until CEQA compliance is completed. The lead agency shall consult with responsible and trustee agencies and affected cities and counties and, when DWR is not the lead agency, shall provide an administrative draft of the draft EIR or Initial Study/Negative Declaration to DWR prior to the public review period. A descriptive narrative must accompany a checklist, if a checklist is used. The lead agency shall conduct a public hearing on the EIR during the public comment period and notify DWR's State Water Project Analysis Office of the time and place of such hearing in addition to other notice required by law.

9. Place of Use: The purchasing contractor must identify the place and purpose of use of the purchased water, including the reasonable and beneficial use of the water.

Typically, this information would be included in the environmental documentation. If a specific transfer proposal does not fit precisely into any of the alternatives listed below, DWR will use the principles described in these Guidelines to define the process to be followed. The information to be provided under this paragraph is in addition to the CEQA information described in Paragraph 8 of these guidelines.

a. If the place of use is within the contractor's service area, the contractor should disclose the purpose of the transferred water, such as whether the water is being acquired for a specific development project, to enhance overall water supply reliability in the contractor's service area, or some other purpose. If the transferred water is for a municipal purpose, the contractor should state whether the transfer is consistent with its own Urban Water Management Plan or that of its member unit(s) receiving the water.

b. If the place of use is outside the contractor's service area, but within the SWP authorized place of use, and service is to be provided by an existing SWP contractor, then, in addition to Paragraph 9(a) above, the contractor should provide DWR with copies of LAFCO approval and consent of the water agency with authority to serve that area, if any. In some instances, DWR's separate consent is required for annexations in addition to the approval for the transfer.

c. If the place of use is outside the SWP authorized place of use and service is to be provided by an existing SWP contractor, the contractor should provide information in Paragraph 9(a) and 9(b). Prior to approving the transfer, DWR will consider project delivery capability, demands for water supply from the SWP, and the impact, if any, of the proposed transfer on such demand. If DWR approves the transfer, DWR will petition State Water Resources Control Board for approval of expansion of authorized place of use. Water will not be delivered until the place of use has been approved by the SWRCB and will be delivered in compliance with any terms imposed by the SWRCB.

d. If the place of use is outside the SWP authorized place of use and service is not to be provided by an existing SWP contractor, DWR will consider the transfer proposal as a proposal to become a new SWP contractor. Prior to adding a new SWP contractor, DWR will consider project delivery capability, demands for water supply from the SWP, and the impact, if any, of the proposed transfer on such demand. DWR will consult with existing SWP contractors regarding their water supply needs and the proposed transfer. In addition to the information in Paragraph 9(a), 9(b), and 9(c), the new contractor should provide information similar to that provided by the original SWP contractors in the 1960's Bulletin 119 feasibility report addressing hydrology, demand for water supply, population growth, financial feasibility, etc.

DWR will evaluate these issues independently and ordinarily will act as lead agency for CEQA purposes. In addition, issues such as area of origin claims, priorities, environmental impacts and use of water will be addressed. The selling contractor may not be released from financial obligations. The contract will be subject to a CCP 860 validation action initiated by the new contractor. If DWR approves the transfer, DWR will petition the SWRCB for approval of expansion of authorized place of use. Water will not be delivered until the place of use has been approved by the SWRCB and will be delivered in compliance with any terms imposed by the SWRCB.

10. DWR Discretion: Consistent with the long-term water supply contract provisions, CEQA, and other provisions of law, DWR has discretion to approve or deny transfers. DWR's exercise of discretion will incorporate the following principles:

    a. As required by CEQA, DWR as an agency with statewide authority will implement feasible mitigation measures for any significant environmental impacts resulting from a transfer if such impacts and their mitigation are not addressed by other public agencies and are within DWR's jurisdiction.

    b. DWR will invoke "overriding considerations" in approving a transfer only as authorized by law, including but not limited to CEQA, and, to the extent applicable, the public trust doctrine and area of origin laws.

If you have any questions or need further information, please contact Dan Flory, Chief of DWR's State Water Project Analysis Office, at (916) 653-4313 or Nancy Quan of his staff at (916) 653-0190.

Appendix C2
Policy 03-10: Guidelines for Review of Proposed Permanent Transfers of State Water Project Annual Table A Amounts

STATE OF CALIFORNIA • RESOURCES AGENCY • DEPARTMENT OF WATER RESOURCES

NOTICE TO
STATE WATER PROJECT CONTRACTORS

NUMBER: 03-10

DATE: 7/3/03

SUBJECT: Principles Regarding Public Participation Process in State Water Project Contract Negotiations

FROM: Michael J. Spear
INTERIM DIRECTOR, DEPARTMENT OF WATER RESOURCES

The Department of Water Resources is issuing the following guidelines prepared in connection with the Settlement Agreement, dated May 5, 2003, reached in *Planning and Conservation League et al. v. Department of Water Resources, 83 Cal. App. 4th 892 (2000).* These guidelines are effective upon the superior court's approval of the Settlement Agreement on May 20, 2003.

1. Policy: Given the importance of the State Water Project to the State of California, and the key role that the long-term water supply contracts play in the administration of the SWP, DWR agrees that public review of significant changes to these contracts is beneficial and in the public interest.

2. Types of Activities to be Covered: Project-wide contract amendments (i.e., contracts with substantially similar terms intended to be offered to all long-term SWP Contractors) and contract amendments to transfer Table A amounts between existing SWP contractors will not be offered to the contractors for execution unless DWR has first complied with the public participation process as described in Paragraphs (3), (4), (5), and (6).

3. The Public Participation Process:

   1) Negotiations will be conducted in public.

   2) The public will be provided with advance notice of the time and place of the negotiations.

   3) The public will be provided the opportunity to observe negotiations and comment in each negotiating session.

4. Timing of Public Participation: Public participation ordinarily will precede the formulation of the project description in the California Environmental Quality Act process in order to assure that the public participation is meaningful. When DWR is a responsible agency, (e.g., when existing SWP contractors agree to transfer Table A amounts between themselves), the public participation will be scheduled to facilitate coordination with the lead agency's CEQA process.

5. Activities That Will Not Be Subject to Public Participation: Informal discussions prior to exchange of formal drafts and discussion of topics that are authorized to be kept confidential by law will not be subject to the public participation process.

6. Contract Amendments Resulting From Litigation: If litigation has been formally initiated, and settlement negotiations result in a proposal to adopt project-wide amendments to settle the litigation, all proposed contract amendments shall be subject to the public participation process before they are approved by DWR.

Notices of public negotiations will be put on the DWR website.

If you have any questions or need further information, please contact Dan Flory, Chief of DWR's State Water Project Analysis Office, at (916) 653-4313, or Nancy Quan of his staff at (916) 653-0190.

Appendix D

Excerpt from Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone (DFG et al. 2010): "Section II. Habitats" including Figures 4 and 5

II. Habitats

Consistent with existing CALFED and Delta Vision policy, the Delta EMZ element of the overall ERP Conservation Strategy intends to implement ecosystem restoration using land acquisitions (both fee and easement title) and cooperative agreements with willing sellers only. This policy is also consistent with the restoration planning process underway for the Suisun Marsh.

> **ERPP Strategic Objective for Habitat Restoration** is to restore large expanses of all major habitat types, and sufficient connectivity among habitats, in the Delta, Suisun Bay, Suisun Marsh, and San Francisco Bay to support recovery and restoration of native species and biotic communities and rehabilitation of ecological processes.
>
> *ERPP, volume 1, July 2000*

The ERP Strategic Plan states that "…the ERP will restore wetland habitats throughout the Bay-Delta ecosystem as part of an ecosystem-based management approach." The ERPP identified a number of habitat types that would be pursued in the Delta EMZ. These habitat types are currently being reviewed and evaluated as a part of a comprehensive effort to analyze various habitat conservation plans in terms of the natural communities they seek to conserve. It is envisioned that once this exercise is completed, scientists and managers will have a better understanding of these natural communities, and will also be better able to monitor status and trends in these natural communities at a regional scale.

There were two strategies in the *Delta Vision Strategic Plan* that incorporated some ideas regarding the creation and restoration of habitat: Strategy 3.1, "Restore large areas of interconnected habitats—on the order of 100,000 acres—within the Delta and its watershed by 2100"; and Strategy 3.2, "Establish migratory corridors for fish, birds, and other animals along selected Delta river channels". These two strategies list actions regarding inundation of floodplain areas, restoration of tidal and riparian habitat, and protection of grasslands and farmlands.

Development of the Conservation Strategy Map.

This element in the Conservation Strategy identifies restoration opportunities within the Delta EMZ, primarily based on land elevations with consideration of current urban land use constraints (Figure 4). Existing non-urban land uses, infrastructure, and other constraints at these locations were not considered for this map. These features will be addressed in future analyses of site-specific proposals. Figure 4 presents a preliminary view of how the Delta could be configured to restore habitat areas to the maximum extent within the Delta EMZ. For this element of the Conservation Strategy, several broad habitat types were identified for restoration, and in the interest of readability, these habitat types are classified according to three ranges of land elevation in which they would primarily occur: upland areas; intertidal areas; or subsided lands/deep open water areas. After incorporating an elevation map of the Delta (DWR 2007), rough contour lines were drawn to identify potential restoration opportunity areas. Appendix D provides a crosswalk between habitat categories in this Conservation Strategy for the Delta EMZ and those in the ERP Plan.

Aquatic Habitat. In accordance with the recommendations in the Delta Vision Strategic Plan and in light of expected sea level rise, the areas of the Delta EMZ that are of highest priority for restoration include lands that are in the existing intertidal range, floodplain areas that can be seasonally inundated, and transitional and upland habitats. Assuming a rise in sea level of ~55" over the next 50-100 years (Cayan et al. 2009), these areas would become shallow subtidal, seasonally inundated floodplain, and intertidal and upland habitats in the future, respectively. In the near term, managers are also interested in conducting experiments on the creation of deep open water areas such as Franks Tract, which is very important for some of the Delta's native pelagic fish species, to test whether these areas can be managed to optimize the quality of habitat in open waters for native fish species.

Agricultural Lands. It is important to note that despite the significant areas of the Delta currently in agricultural production that are suitable for creation of habitat areas, most areas of the Delta are expected to remain in active agricultural production well into the future. Expected reductions in the availability of freshwater for all beneficial uses due to changing precipitation patterns and extended droughts means that sea level rise will increase salinity into some areas of the Delta, particularly the western and central Delta, even absent any natural perturbations such as an earthquake. There simply will not be enough freshwater in the future to continue maintaining all parts of the Delta as a freshwater pool year-round. It is therefore probable that Delta agriculture will adapt naturally over time to these expected changes in the Delta, through a combination of planting more drought- and salt-tolerant crops as agricultural biotechnology becomes more widely available; growing crops that can be used to produce ethanol or other biofuels; seeking more opportunities for cultural/economic diversification (e.g. ecotourism); and managing wetlands and associated plants for wildlife benefits and/or toward development of a carbon emissions offset trading market. Some U.S. Department of Agriculture programs already exist that provide financial incentives for landowners to manage natural areas on their properties (including but not limited to the Wildlife Habitat Incentives Program, the Environmental Quality Incentives Program, and the Conservation Reserve Program), and while largely successful in other states, funding for implementation of these programs in California must be augmented to make participation more attractive to landowners who face higher capital and production costs.

To accommodate future shifts in habitats and species' distribution, ERP will continue to fund projects on agricultural lands which benefit wildlife and ensure that agricultural properties are not developed or converted to land uses that will not be as well-suited for adaptation to the Delta's future conditions.

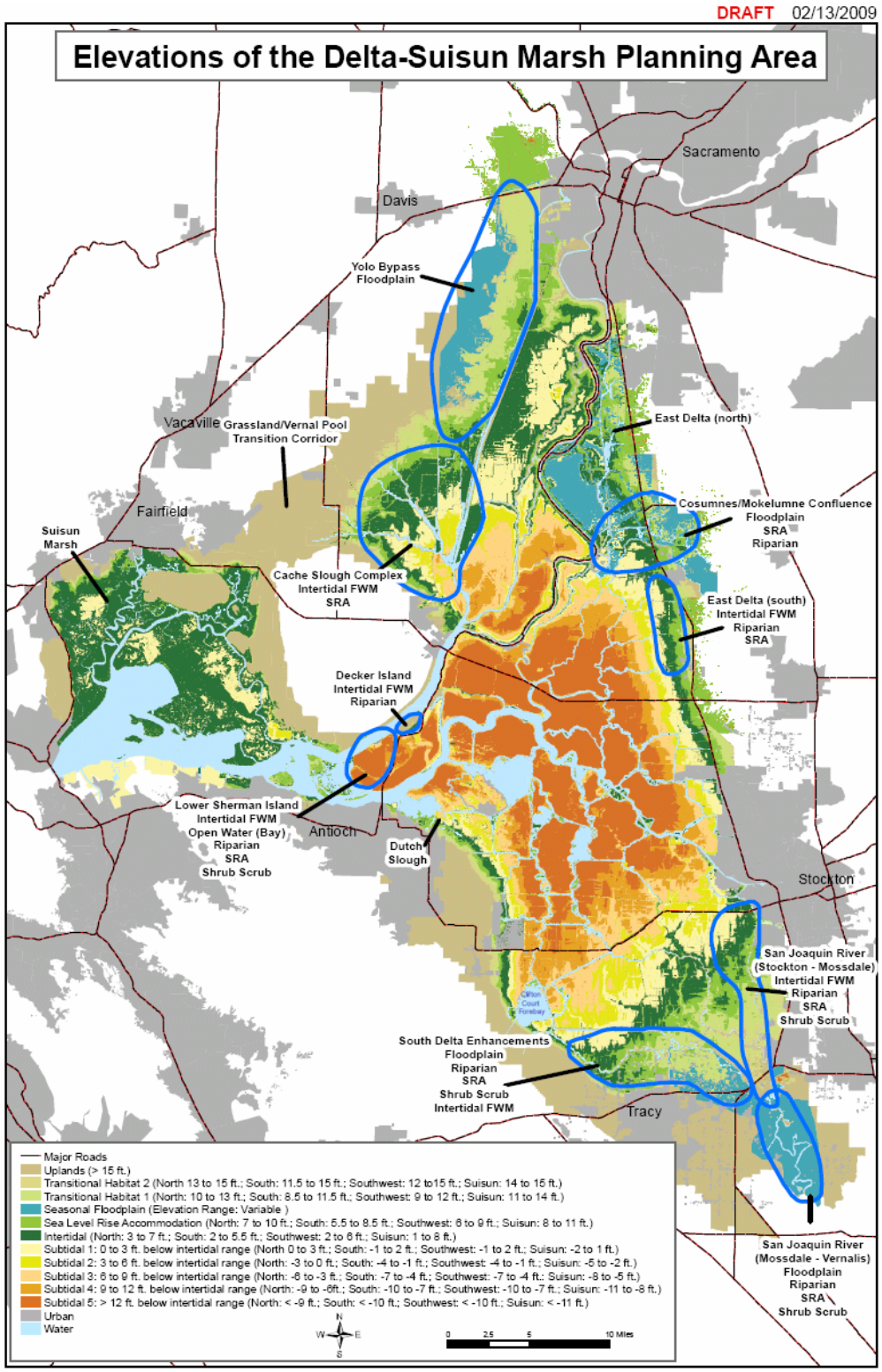

Figure 4: Land elevations in the Delta EMZ will largely determine what habitat types can be accommodated.

II.A. Upland Areas

With increasing sea level, global warming, and regional climate change, Delta habitats and species are going to require connectivity to higher elevation areas. Changes in regional climate are expected to result in precipitation patterns of more rain and less snow, shifting tributary peak runoff from spring to winter, making extreme winter runoff events more frequent and intense, and bringing about longer dry periods in summer. In light of these expected changes, and ongoing conversion of open space lands to urban uses, some of these higher elevation areas will be expected to accommodate additional flood flows in new or expanded floodplain areas.

Upland areas in the Delta EMZ are best characterized as lands well above current sea level (greater than ~5 feet in elevation, depending on location). Aquatic habitats in this category include seasonally-inundated floodplain, seasonal wetlands (including vernal pools), and ponds, while terrestrial habitats in this category include riparian areas, perennial grasslands, and inland dune scrub, as well as agricultural lands. Creating a mosaic of different upland habitat types, increasing their geographic distribution, and enhancing the connectivity between them is important for maintaining genetic diversity of the numerous species which use these areas for all or part of their life cycle. The aquatic and terrestrial habitat types that comprise upland areas often co-occur (e.g. agricultural lands that are seasonally inundated to benefit waterfowl, and perennial grasslands that support vernal pools). Thus, this habitat category highlights the importance of preserving and enhancing a diversity of habitats in support of numerous species and ecological processes, as well as allowing the system to respond to drivers of change such as sea level rise.

The rationales for protection and enhancement of seasonal wetlands, vernal pools, riparian areas, perennial grasslands, and inland dune scrub are contained in the ERPP, and the reader is encouraged to refer to these volumes for more information. For the purposes of this Conservation Strategy, the discussion on restoring upland habitats will be focused on seasonally-inundated floodplains, a proposed corridor of upland transitional habitat linking the Cache Slough area to Suisun Marsh, and protection of agricultural and open space lands for wildlife-compatible uses.

Potential Stage 2 Actions for Upland Areas:

Action 1: Acquire land and easement interests from willing sellers in the East and South Delta that will accommodate seasonal floodplain areas, and shifts in tidal and shallow subtidal habitats due to future sea level rise.

Action 2: Conduct research to determine scale and balance of flow, sediment, and organic material inputs needed to restore riverine ecosystem function.

Action 3: Develop a better understanding of species-habitat interactions, species-species interactions, and species' responses to variable ecosystem conditions in order to better determine natural versus human-induced responses of upland habitat restoration.

Action 4: Determine contaminant and runoff impacts of agriculture and urban areas, and anticipate effects on the ecosystem from future expansion of these land uses.

Action 5: Pursue large-scale riparian vegetation along waterways wherever feasible, including opportunities for setback levees.

Much has been learned about creating habitats in upland areas since 2000,

particularly with respect to seasonally-inundated floodplains and their importance to many of the Delta's aquatic species. As knowledge has increased, the risk and uncertainty associated with restoring this habitat is decreasing. Thus, restoration of seasonally-inundated floodplains is a very high priority for the Delta EMZ in the near term.

Floodplain. A natural floodplain is an important component of rivers and estuaries that allows many essential ecological functions to occur. Healthy floodplains are morphologically complex, including backwaters, wetlands, sloughs, and distributaries that carry and store floodwater. Floodplain areas can constitute islands of biodiversity within semi-arid landscapes, especially during dry seasons and extended droughts. The term *floodplain* as used here means the generally flat area adjoining rivers and sloughs that is flooded by peak flows every 1.5-2 years and exceed the capacity of the channel ("bankfull discharge"). Peak flows in winter and spring that happen every 1.5-2 years are considered by river geomorphologists to be the "dominant discharge" that contributes the most to defining the shape and size of the channel and the distribution of sediment, bar, and bed materials. Larger flood events can cause major changes to occur, but they do not happen often enough to be the decisive factor in river geomorphology.

Floodplain areas have the potential to support highly productive habitats, as they represent a heterogeneous mosaic of habitats including riparian, freshwater tidal marsh, seasonal wetlands, perennial aquatic, and perennial grassland habitats, in addition to agricultural lands. Floodplains are used by numerous native fish for spawning and growth during their life cycles (Moyle 2002). There has been extensive research on the Yolo Bypass and lower Cosumnes River (in addition to some research in the Sutter Bypass) indicating that native resident and migratory fish show a positive physiological response (i.e. enhanced growth and fitness) when they have access to floodplain habitats (Ribeiro et al. 2004, Moyle et al. 2007), which likely benefits them as they complete subsequent stages of their respective life cycles. Inundated floodplain areas provide important spawning and rearing habitat for splittail and rearing habitat for Chinook salmon (Sommer et al. 2001, Sommer et al. 2002, Moyle et al. 2007). Splittail must spawn in floodplains (Moyle et al. 2004); without access to adequate floodplain spawning habitat, splittail reproduction declines drastically as seen during the 1990s.

Managing the frequency and duration of floodplain inundation during the winter and spring, followed by complete drainage by the end of the flooding season, could favor native fish over non-natives (Moyle et al. 2007, Grimaldo et al. 2004) and reduce nuisance insect problems. Duration and timing of inundation are important factors that influence ecological benefits of floodplains. PWA and Opperman (2006) have defined a Floodplain Activation Flow for floodplains on the Sacramento River: desired ecological outcomes likely would arise from an inundation regime that:

- Occurs between March 15 and May 15
- Accommodates active flooding for a minimum of seven days (although floodplain inundation would likely persist considerably longer); and
- Occurs two out of every three years

Floodplain Activation Flows are very important, as are periodic large volume flows. Large-scale events are more effective at reworking the floodplain landscape in a natural way. Studies on the Cosumnes and Sacramento Rivers indicate that dynamic processes are needed to support complex dynamic riparian habitats and upland systems which form the floodplain habitat (Moyle et al. 2007). Native plants and animals adapted to random events that are characteristic of California's hydrology; these random events help to control non-native plants and animals.

In the Sacramento Valley, the Yolo Bypass has the greatest promise for large-scale (8,500+ acres) restoration of floodplain areas and processes at modest flow rates (2,000 cfs) (PWA and Opperman 2006). The Floodplain Activation Flows timing and rate of inundation are minimum values for ecological benefits; as the flow rate increases the ecological benefit increases as well. PWA and Opperman (2006) outlined a methodology to use with other floodplains that can be applied to the San Joaquin River and the lower Mokelumne River.

Research on the Cosumnes River also shows the many ecosystem benefits that floodplains provide. The Cosumnes River is the only remaining unregulated mainstem river on the western slope of the Sierra Nevada. The Cosumnes River Preserve comprises 46,000 acres and includes all associated Central Valley. The free-flowing nature of the river allows frequent and regular winter and spring overbank flooding that fosters the growth of native vegetation and the wildlife dependent on those habitats. In addition to the value of floodplain habitat to the Delta's native species, floodplains are believed to enhance the estuarine food web, as they support high levels of primary and secondary productivity by increasing residence time and nutrient inputs into the Delta (Sommer et al. 2004). Ahearn et al. (2006) found that floodplains that are wetted and dried in pulses can act as a productivity pump for the lower estuary. With this type of management, the floodplain exports large amounts of Chlorophyll *a* to

Potential Stage 2 Actions for Floodplains:

Action 1: Continue Aquatic Restoration Planning and Implementation (ARPI) activities such as habitat enhancement and fish passage improvements in the Yolo Bypass. Continue coordination with Yolo Basin Foundation and other local groups to identify, study, and implement projects on public or private land with willing participants, to create regionally significant improvements in habitat and fish passage.

Action 2: Continue working with the participants in the Yolo Bypass Strategic Plan process to ensure the project scope builds upon investments in the Lower Bypass.

Action 3: Continue implementing projects at the Cosumnes River Preserve, such as restoring active and regular flooding regimes and flood riparian forest habitat; measuring flora and fauna response to restoration; and monitoring surface and groundwater hydrology and geomorphic changes in restored areas.

Action 4: Pursue opportunities for land and easement acquisitions in the Yolo Bypass and along the lower Cosumnes and San Joaquin Rivers, which could be utilized as floodplain inundation areas in the near term or in the future.

the river. Native fish have shown many benefits from floodplain habitat on the Cosumnes Preserve (Moyle et al. 2007, Swenson et al. 2003, Ribeiro et al. 2004, Grosholz and Gallo 2006).

Because floodplain areas are inundated only seasonally, many other habitat types that occur in upland areas can be accommodated on floodplains when high winter and early spring flows are not present. The Department of Water Resources' Flood Protection Corridor Program provides grant funding to local agencies and nonprofit organizations for nonstructural flood management projects that include wildlife habitat enhancement and/or agricultural land preservation, and acquisition of flood easements. Such easements provide a way to bring floodplain benefits to species seasonally, while also accommodating agricultural production in summer, fall, and early winter. Delta crops such as rice, grains, corn, and alfalfa provide food for waterfowl and other terrestrial species, and serve as surrogate habitat in the absence of historical habitat such as tidal marsh. From Highway 99 west to the Cosumnes River Preserve is a good example of an area that provides wildlife-friendly agriculture mix. It is the largest conservation easement acquisition funded by ERP during Stage 1. The ERP also provided funding for planning or for property acquisitions and restoration of wildlife friendly agriculture in the Yolo Bypass, along the Cosumnes River, and along the San Joaquin River near Mossdale Crossing.

Although the benefits of floodplains have been demonstrated, there are a few cautions that must be realized considering seasonal floodplain areas for restoration:

- Restoration must incorporate as much natural connection with the river as possible, to reduce potential stranding of native fish. Large-scale flooding events also help reduce stranding by creating channels on the landscape which allow for natural drainage, and multiple pulse flows help ensure fish receive the migratory cues they need.
- The periodic wetting and drying of floodplain areas make these areas especially prone to methylmercury production and transport. Within the context of the Delta Total Maximum Daily Load (TMDL) for methylmercury that is currently under development, floodplain restoration activities should include the investigation and implementation of Best Management Practices (BMPs) to control methylmercury production and/or transport.

Upland Transitional Corridor. There is interest in establishing a corridor of upland habitats between the Delta's Cache Slough area and the Suisun Marsh, both to protect valuable habitats that occur there and to facilitate the movement of wildlife between the two areas. This proposed corridor currently contains a mosaic of perennial grasslands and vernal pool areas, and has been identified by local planners as having great potential for ecological benefits from restoration. It is possible that channels may also be constructed in this corridor, to provide a migratory route for endemic species that use the Delta and Suisun Bay (e.g. delta and longfin smelt and anadromous fish species).

II.B. Intertidal Areas

Tidal marshes play a critical role for native fish including salmonids by providing forage and refuge from predators (Boesch and Turner 1984, Baltz et al. 1993, Kneib 1997, Kruczynski and Ruth 1997) resulting in higher growth rates.

Intertidal areas in the Delta EMZ are best characterized as lands between one and seven feet above sea level, depending on location (Figure 4). All lands in the intertidal range are assumed to have the ability to support some tidal marsh habitats (either brackish or freshwater) with associated sloughs, channels, and mudflats. Some areas are capable of supporting large areas of contiguous habitat, and others may support only small patches (e.g. mid-channel islands and shoals). Properly functioning tidal marsh habitats have subtidal open water channels with systems of dendritic (branchlike), progressively lower-order intertidal channels that dissect the marsh plain. These diverse habitats provide structure and processes that benefit both aquatic and terrestrial species.

The rationales for protection and enhancement of fresh and brackish tidal marsh areas are contained in the ERPP, and the reader is encouraged to refer to these volumes for more information. For the purposes of this Conservation Strategy, the discussion on restoring habitats in intertidal areas will be focused on what has been learned about the importance of these areas since 2000, particularly as it relates to various species' use of tidal marsh areas and the role of these areas in enhancing the aquatic food web.

Studies of species' use of tidal marsh habitat in the Delta are limited, but ERP and other programs have conducted several studies since the ROD that continue to augment the knowledge regarding the role of intertidal habitats for desirable aquatic species. The largest effort to study tidal marsh habitat in the Delta and its benefits to native fish was a series of projects known as the BREACH studies (http://depts.washington.edu/calfed/breachii.htm), which investigated geomorphology, sedimentation, and vegetation at four reference and six restored tidal marsh sites in the Delta. Of the one reference and three restored sites sampled for fish and invertebrates, relative density of both native and introduced fish species was higher at the reference marsh (Simenstad et al. 2000). Although all of the sites were dominated by non-native fish, the abundance of native fish was highest in winter and spring (Grimaldo et al. 2004). In stomach content analyses, all life stages of chironomids (midges) were shown to be a very important food source for fish, both adjacent to tidal marsh habitats and in open water areas. Chironomids' association with marsh vegetation indicates the importance of this habitat to the aquatic food web. Overall abundance of fish larvae was highest in marsh edge habitat when compared to shallow open water and river channels (Grimaldo et al. 2004). Unfortunately the BREACH study sites are not representative of the Delta's large historic marshes. Most sites are small and severely degraded areas located along the edge of levees or on small channel islands.

An example of an ongoing study of species' use of tidal marsh within intertidal land elevations is the ongoing monitoring associated with restoration of Liberty Island, a 5,209-acre island in the northern Delta that breached naturally nearly ten years ago. The

Liberty Island project provides a good example of passive restoration to various habitat types, including some deeper, open water, subtidal, areas at the southern end and freshwater emergent tidal marsh, and sloughs with riparian habitat at the higher elevations at the northern end. Liberty Island's sloughs are populated with otters, beavers, muskrats, and numerous species of ducks and geese. Native fish species using the area include Chinook salmon, Sacramento splittail, longfin and delta smelt, tule perch, Sacramento pike minnow, and starry flounder. In some areas, native species account for up to 21% of the fish collected, for reference, native species only account for ~2-10% elsewhere (Malamud-Roam et al. 2004). Ongoing monitoring at Liberty Island is showing that fish species assemblages at this restored area, which is approaching eight years', increasingly resembles assemblages at reference marsh sites. The ERP hopes to build upon the success of this restoration project by increasing the size of the project and developing a dendritic channel system on its interior (DFG 2008b).

A number of additional studies are demonstrating that regardless of species' actual use of tidal marsh areas, these habitats could be extremely important for their possible role in augmenting the Delta's aquatic food web, particularly in the saline portion of the estuary.

- Tagging and stomach content studies show that Chinook salmon fry may use intertidal habitat. According to Williams (2006), tagged hatchery fry remain in the Delta up to 64 days and tend to occupy shallow habitats, including tidal marsh. Stomach contents of salmon rearing in the Delta are dominated by chironomids and amphipods, suggesting that juvenile salmon are associated with marsh food production. Juvenile salmon in the Delta also undergo substantial growth (Kjelson et al. 1982, Williams 2006). These findings coincide with studies elsewhere in the Pacific Northwest (Healey 1982, Levy and Northcote 1982, Simenstad et al. 1982), which found that Chinook salmon fry usually occupy shallow, near-shore habitats including tidal marshes, creeks, and flats, where they feed and grow and adapt to salt water (Healey 1982; Levy and Northcote 1982; Simenstad et al. 1982), and that they often move into tidal wetlands on high tides and return to the same channels on several tidal cycles (Levy and Northcote 1982). Also, in estuaries throughout Washington, subyearlings and fry occur mainly in marshes when these habitats are available (Simenstad et al. 1982). In fact, Healey (1982) identified freshwater tidal marshes as the most important habitat to juvenile salmon in the Pacific Northwest. More recently, in the Columbia River estuary, emergent tidal marsh has been shown to support the greatest abundance of insects and highest stomach fullness scores for juvenile salmon (Lott 2004), with chironomids again being the dominant prey item.
- In a study of carbon types and bioavailability, tidal marsh sloughs in Suisun Bay had the highest levels of dissolved, particulate, and phytoplankton-derived carbon (Sobczak et al. 2002). Chlorophyll *a* concentration, used as a measure of standing crop of phytoplankton, was highest in tidal sloughs and supports the greatest zooplankton growth rate (Muller-Solger et al. 2002) when compared to other habitat types, such as floodplains and river channels. High levels of primary production (as measured by chlorophyll a) seen in several regions in the interior of Suisun Marsh is likely due to high residence time of water, nutrient availability, and absence of non-native clams (DFG 2008b).

- Modeling (Jassby et al. 1993 and Cloern 2007) and empirical studies (Lopez et al. 2006) show that productivity from high-producing areas, such as marsh sloughs, is exported to other habitats. Phytoplankton biomass location is only weakly correlated with phytoplankton growth rates across several aquatic habitats, therefore other processes, including mixing and transport, are important in determining phytoplankton distribution in the Delta. The data shows that Suisun Marsh plays a significant role in estuarine productivity by providing an abundant source of primary production and pelagic invertebrates, both of which are significantly depleted in bay and river channel areas (DFG 2008b).
- In a nutrient-rich estuary, tidal freshwater marsh has the ability to transform or retain up to 40% of ammonia entering the marsh during a single flood tide. Nitrification (the conversion of ammonia to nitrate) accounted for a large portion of the transformation (30%). Nitrification rate in the marsh system was measured at 4-9 times that which occurs in the adjacent water column (Gribsholt et al. 2005). The marsh sediment and biofilm (mudflats) are important sites at which this nitrification occurs. Tidal marsh may therefore have the ability to improve the base of the aquatic food web in the Delta by increasing primary production within the marsh itself, and by increasing the ratio of nitrate to ammonia in the estuary. In the absence of actions to reduce inputs of ammonia into the system, tidal marsh restoration is a promising method of mediating the effects of these inputs. Tidal marsh may increase the likelihood of phytoplankton blooms in the estuary through nitrification and retention of ammonia; as presented in the discussion of the aquatic food web, ammonia inhibits phytoplankton blooms in Suisun Bay and possibly other open-water habitats in the Delta, therefore lowering overall productivity (Wilkerson et al. 2006, Dugdale et al. 2007).

Potential Stage 2 Actions for Tidal Marsh (intertidal areas):

Action 1 : Continue habitat restoration, property acquisition, planning, and monitoring on specified sites:

- Hill Slough habitat restoration (Suisun Marsh)
- Mein's Landing restoration (Suisun Marsh)
- Blacklock restoration monitoring (Suisun Marsh)
- Cache Slough complex, including Prospect and Liberty islands, and Lindsey Slough.
- Yolo Bypass Wildlife Area (tidal and seasonal wetlands on 700 acres)

Action 2: Implement and monitor the Dutch Slough restoration project, which would restore up to 483 acres of emergent wetland (a portion of which would be tidal), and generate information on how to best restore tidal marsh habitat.

Action 3: Continue studies in the lower Yolo Bypass to greatly improve understanding of aquatic species' response to tidal wetland restoration. Evaluate physical and geomorphic processes and monitor connectivity and key ecological variables (comparing Yolo Bypass and Cosumnes River systems) to assess effects of seasonal and interannual hydrologic variability.

Action 4: Conduct studies to determine whether fish benefits from tidal marsh that have been demonstrated in the saline portion of the estuary are also true for the freshwater portion of the estuary.

Action 5: Conduct studies to determine whether inundation of marsh plains on the flood tide at night results in cooler water being returned to the channels on the ebb tide.

At the outset of ERP, restoration of intertidal and shallow subtidal areas (at that time, termed "shallow water habitat", defined as water less than two meters in depth at mean

lower low water) was a very high priority, and based on what has been learned since 2000, continues to be a very high priority for the Delta EMZ. However, the extensive spread of non-native submerged aquatic vegetation (SAV) in intertidal and shallow subtidal areas renders them less suitable for native fish (Nobriga and Feyrer 2007, Nobriga et al. 2005, Brown and Michniuk 2007). Brown and Michniuk (2007) reported a long-term decline in native fish abundance relative to nonnative fish. This decline in native fish abundance occurred coincident with the range expansion of non-native SAV (principally *Egeria densa*) and non-native black bass (centrarchids), both of which are discussed further in the Stressors section below. Predation by largemouth bass is one mechanism hypothesized to result in low native fish abundance where SAV cover is high (Brown 2003, Nobriga et al. 2005). Largemouth bass have a higher per-capita predatory influence than all other piscivores in SAV-dominated intertidal zones (Nobriga and Feyrer 2007). Restoration Delta intertidal habitats must, therefore, be designed and managed to discourage non-native SAV, or native fish may not benefit from them (Nobriga and Feyrer 2007, Grimaldo et al. 2004).

In summary, restoration of tidal marsh areas in the Delta remains a very high priority for the ERP; however, several cautions must be kept in mind. A major concern is that restored tidal marsh would be colonized by non-native species, which would in turn limit the benefits to native species. Other potential constraints facing the restoration of intertidal habitats include the methylation of mercury in sediments, and contamination from the placement of dredge spoils to achieve optimal land elevations for marsh creation. Therefore, restoration of tidal marsh within intertidal land elevations should be designed as large-scale experiments, and should be rigorously monitored to establish relationships between this habitat and species' population abundance. As this information continues to be collected and synthesized, the risk and uncertainty associated with restoring this habitat are expected to decrease.

II.C. Subsided Lands/Deep Open Water Areas

Subsided land areas in the Delta EMZ are best characterized as land well below current sea level (deeper than ~ -6 feet in elevation), and include both terrestrial areas (islands that have subsided over time) and deep open water areas (subsided islands that flooded in the past and were never reclaimed). Aquatic habitats in this category include seasonal wetlands and ponds that occur within subsided land areas, in addition to deep open water areas such as Franks Tract (also called pelagic habitat).

With increasing sea level, global warming, and regional climate change, the existing configuration of Delta levees and deeply subsided islands is not expected to remain intact over the long term. A forecast rise in sea level of approximately 55 inches over the next 50-100 years (Cayan et al. 2009) is expected to increase pressure on the Delta's levee system. Changes in regional climate and the shift of tributary peak runoff from spring to winter are expected to make extreme winter runoff events more frequent and intense, further compounding pressure on Delta levees seasonally. In light of these expected changes, in addition to human-induced impacts (e.g. increased runoff from continued conversion of open space lands to urban uses), there is a considerably higher likelihood

of Delta levee failure and subsequent island flooding in the future. ERP implementation must therefore adapt to these expected pressures, including planning for optimizing the value of newly-flooded deep islands for the aquatic species that may utilize them in the future.

Terrestrial areas in this category include mainly agricultural lands, some of which are not in active agricultural production. Central Valley Joint Venture (2006) recognizes that agricultural easements to maintain waterfowl food supplies and buffer existing wetlands from urban development may become increasingly important in basins where large increases in human populations are predicted. In addition, ongoing rice cultivation may help minimize subsidence. Subsidence reversal, carbon sequestration, and wildlife-friendly agricultural projects are appropriate on these deep islands in the near term, as they are expected to begin reversing land subsidence and to provide benefits to the local economy, wildlife, and waterfowl while protecting lands from uses that may be unsustainable over the longer term.

The rationales for protection and enhancement of seasonal wetlands and wildlife-friendly agriculture are contained in the ERPP, and the reader is encouraged to refer to these volumes for more information. For the purposes of this Conservation Strategy, the discussion on restoring habitats on subsided lands will be focused on subsidence reversal and carbon sequestration, and on restoring deep open water areas for the Delta's pelagic fish species.

Subsidence reversal. The exposure of the bare peat soils to air causes oxidation which results in subsidence, or a loss of soil on Delta islands. Flooding these lands and managing them as wetlands reduces their exposure to oxygen, so there is less decomposition of organic matter, which and stabilizes land elevations. Biomass accumulation sequesters carbon and helps stop and reverse subsidence (Fujii 2007). As subsidence is reversed, land elevations increase and accommodation space, the space in the Delta that lies below sea level and is filled with neither sediment nor water (Mount and Twiss 2005), on individual islands is reduced. A reduction in accommodation space decreases the potential for drinking water quality impacts from salinity intrusion in the case of one or more levee breaks on deeply subsided Delta islands.

A pilot study on Twitchell Island funded by the ERP in the late 1990s investigated methods for minimizing or reversing subsidence which have shown great promise for the Delta's subsided lands. By flooding soils on subsided islands approximately one foot deep, peat soil decomposition is stopped, and conditions are ideal for emergent marsh vegetation to become established. In the Twitchell Island pilot project, researchers saw some initial soil accumulation during the late 1990s and early 2000s, and noted that accretion rates accelerated and land surface elevation began increasing much more rapidly after about seven years, as plant biomass was accumulated over time. Land surface elevation is estimated to be increasing at an annual rate of around 4 inches, and is expected to continue to increase (Fujii 2007).

The USGS is interested in implementing a subsidence reversal program Delta-wide, given the results of their Twitchell Island pilot study. Such a program would involve offering financial incentives to landowners to create and manage wetland areas on their lands (Fujii 2007). Large-scale, whole-island approaches to reversing subsidence would be beneficial for multiple purposes. Programs that offer incentives for 10- or 20-year studies for subsidence reversal on large tracts of land could help improve Delta levee stability and reduce the risk of catastrophic failure. Assuming that accretion rates continue at about 4 inches annually, estimates suggest a 50% reduction in accommodation space in 50 years if subsidence could be pursued throughout the Delta. This reduction in accommodation space jumps to 99% over the next 100 years) (Fujii 2007). Some deeply subsided lands could also be used as disposal sites for clean dredged sediments, providing local flood control improvements while helping raise land elevations on subsided islands more quickly. This accommodation space reduction, in addition to helping stabilize levees over the longer term, would allow future restoration of additional tidal marsh habitats.

Potential Stage 2 Actions for Subsided Lands/Deep Open Water Areas:

Action 1: Implement wildlife-friendly agriculture and wetland projects (e.g. in partnership with Farm Bill programs).

Action 2: Secure easements and land interests on which subsidence reversal projects can occur (e.g. in partnership with USGS).

Action 3: Conduct experiments on the creation and management of deep open water areas. Some potential locations include:

- Lower Sherman Island
- Little Egbert Tract

Action 4: Continue to monitor deep open water areas on Liberty Island for environmental conditions and species use

While the primary objectives of creating wetlands on deep Delta islands would be to reverse subsidence and sequester carbon, there would be significant ancillary benefits to wildlife such as waterfowl. Delta agricultural lands and managed wetland areas provide a vital component to Pacific Flyway habitat for migratory waterfowl by increasing the availability of natural forage, ensuring improved body condition and breeding success (CALFED 2000b).

Deep open water areas. All permanent aquatic habitats in the Delta are occupied by fish of some type. In planning for restoration of Delta aquatic habitats, it is important to consider which fish will occupy what habitat and when; and what type of benefits fish will gain from the habitat. Fish assemblages in the Delta, each with a distinct set of environmental requirements, include native pelagic species (e.g. delta and longfin smelt), freshwater planktivores, dominated by non-native species such as threadfin shad and inland silverside; anadromous species (e.g. salmon and steelhead), slough-residents associated with beds of SAV (e.g. black bass), and freshwater benthic species (e.g. prickly sculpin) (Moyle and Bennett 2008). Habitat diversity is necessary to support multiple fish assemblages in the delta. Restoration efforts need to focus on creating habitats required by desirable species assemblage, while avoiding habitats dominated by undesirable species.

With the increasing threats of levee failure from continuing land subsidence, exacerbated by sea level rise, higher seasonal runoff, and random events such as an earthquake, the Delta is likely to have more large areas of deep, open water in the future (Moyle and Bennett 2008). Important managed attributes include salinity, contaminant inputs, and connectivity to surrounding habitats, to increase habitat variability, and provide a greater diversity in water quality conditions (Moyle and Bennett 2008). Fish assemblages will respond differently to future environmental changes.

New open water habitats may also result from intentional activities on a smaller and more managed scale than whole-island flooding. The intentional removal of levees on islands at the periphery of the Delta in order to create marsh habitat on intertidal land elevations would result in open water below the tidal zone similar to what's developing at Liberty Island. Exchange of materials between the restored tidal marsh with adjacent open water could result in higher productivity in open water habitat. As mentioned in the discussion of tidal marsh restoration, the potential for SAV dominated by non-native species to establish in new shallow water environments is a concern. On Liberty Island, SAV has not become a dominant component of the open water habitat. This may be a result of tidal flow velocities, wind-induced disturbance, or some other factor. Continuing research and monitoring of the Liberty Island project will improve understanding of the dynamics of a large island breach at the periphery of the Delta, and help plan for future marsh or open water restoration projects.

There are many unknowns about future characteristics of flooded island, and open water habitat (Moyle and Bennett 2008). These include configuration and location of flooded islands; physical properties such as depth, turbidity, flow, and salinity; biological properties such as productivity of phytoplankton and copepods; and susceptibility to invasion by non-native species such as *Egeria densa*, centrarchids, and invasive non-native clams. Creation of pelagic habitat is therefore not guaranteed to have a population-level benefit to native fish (Moyle and Bennett 2008). Adaptive management, combined with large-scale experimentation on new open water habitat, would help to reduce uncertainties. This could occur through the planned flooding of at least one Delta island, or through an organized study plan that would go into effect in the event of an unplanned levee breach (Moyle and Bennett 2008).

II.D. Ecological Management Unit (EMU) Restoration Priorities

Based upon the ERPP descriptions of habitat types that fit into the upland, intertidal, and subsided/deep open water classifications, some near-term land acquisition and habitat enhancement priorities have been identified for the four Delta Ecological Management Units (EMUs) of the Delta EMZ (Figure 5). As agricultural lands comprise a significant amount of area within each EMU, it is intended that some conversion of land from agricultural uses will occur to accommodate specific habitat types. In some cases, this conversion would occur over the course of a few years. In others, acquired lands may not be converted to other uses unless or until a new water conveyance facility is constructed and operational. Therefore, it is expected that most agricultural lands will remain in productive agriculture for the foreseeable future, and any funding from the ERP for

wildlife-friendly agriculture projects, subsidence reversal projects, or long-term easements to protect lands from permanent crops (i.e. orchards and vineyards) and other development will be considered on a case-by-case basis. Therefore, discussion of agricultural lands is not included within the descriptions of EMU restoration priorities.

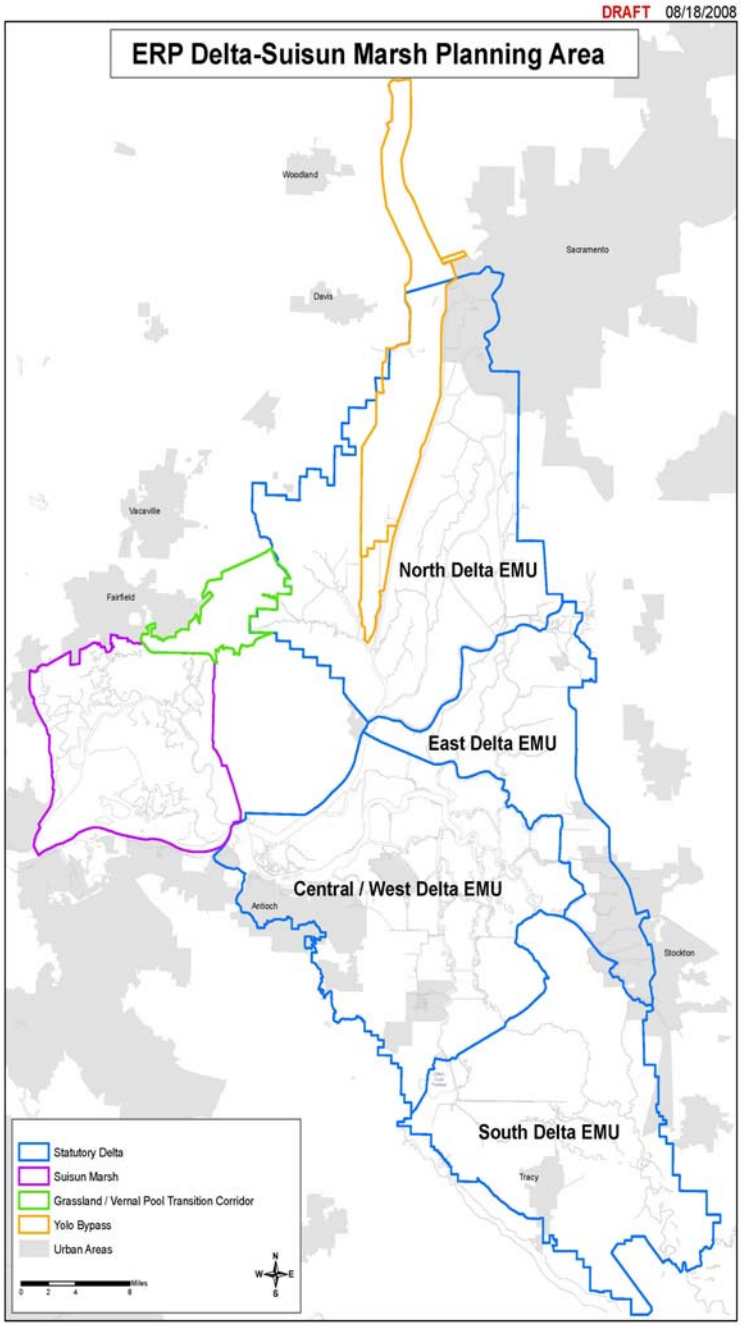

Figure 5: Map of EMUs within the Delta EMZ

North Delta EMU.

- *Cache Slough Complex.* Restore a mosaic of deep open water, shallow subtidal, tidal marsh, riparian, perennial grasslands, and vernal pool habitats. The Cache Slough Complex includes some properties that are currently in public ownership or are already protected for conservation purposes: Prospect Island, which could accommodate tidal marsh, and Liberty Island, which could accommodate deep open water, shallow subtidal, and tidal marsh areas. The Cache Slough Complex also includes Little Egbert Tract, which could accommodate some seasonal floodplain just south of Liberty Island; the elevation of Little Egbert Tract also makes it a good candidate for experimentation on the creation of shallow subtidal and deep open water areas, to help design future restoration projects geared toward benefiting delta smelt.
- *Yolo Bypass.* Restore a mosaic of seasonal floodplain, riparian, perennial grasslands, and vernal pool habitats. The Yolo Bypass area has been under investigation for several years for its potential to provide floodplain habitats benefiting Delta species, and it is a high priority of the ERP to provide these functions in this area in the near term. In addition, private entities are currently acquiring properties in the Yolo Bypass with the intent of restoring habitats and securing water supplies. Over the longer term, this area is expected to also include tidal marsh, as it accommodates sea level rise.

Central/West Delta EMU.

- *Deeply Subsided Islands.* Levees around at least one of these deep subsided islands could be breached or removed in order to create deep open water areas. Recognizing that the land area of the Central/West Delta EMU consists of primarily deeply subsided islands which could accommodate subsidence reversal experiments and wildlife-friendly agricultural practices, land elevations in this area also provide a major opportunity to increase delta smelt habitat area.
- *Dutch Slough.* Construct the Dutch Slough habitat restoration project. This project proposes to create tidal marsh and shallow subtidal areas on lands adjacent to the deep open water areas of Big Break, north of Oakley. Due to the expenditure of funds to acquire the properties, the ecological benefits the project is expected to yield, and the unique opportunity that the design of this project gives to experiment with restoration techniques, this is a high-priority project for implementation in the near term. Implementation of this project is expected to help answer a key question of whether an island will support sustainable native fish habitat (i.e. tidal marsh) if it's surrounded by non-native fish habitat (i.e. shallow subtidal areas at Big Break).
- *Upper Sherman Island.* Pursue opportunity to experiment with creation of deep open water areas. Sherman Island is currently owned by the State of California, and its land elevation, which is significantly below sea level, offers a unique opportunity to create deep open water areas that are expected to benefit the Delta's native pelagic fish species.

East Delta EMU.

- *Cosumnes-Mokelumne Confluence.* Create a mosaic of seasonal floodplain, riparian, shallow subtidal, and tidal marsh areas. The confluence of the Cosumnes and Mokelumne river systems has been an area of extensive property acquisitions (Cosumnes River Preserve), and continues to be an important area for restoring floodplains and seasonal wetlands. In the near term, ERP plans to restore acquired properties (e.g. McCormack-Williamson Tract). In addition, areas north and south of the Cosumnes-Mokelumne confluence are at land elevation, which would accommodate tidal marsh and shallow subtidal areas.
- Acquisition of lands at the eastern periphery of the Delta EMZ, could be restored to shallow subtidal and tidal marsh areas in the future as sea level rises, will also be pursued in the near term; however, restoration of these properties (many of which are currently in private ownership) may not become a high priority unless and until a new water supply conveyance facility is in place.

South Delta EMU.

- *Lower San Joaquin River.* Create a mosaic of seasonal floodplain, riparian, shallow subtidal, and tidal marsh areas. Acquisition of lands in the South Delta EMU that will accommodate shallow subtidal and tidal marsh areas in the future as sea level rises may be pursued in the near term; however, restoration of these properties (many of which are currently in private ownership) may not become a high priority unless and until a new water supply conveyance facility is in place.

Upland Transition Corridor.

- In addition to habitat restoration actions in the four Delta EMUs that comprise the Delta EMZ, there is significant interest in establishing a new connection between the Delta and the Suisun Marsh, by way of a new corridor connecting the Cache Slough Complex to northeastern Suisun Marsh. This proposed corridor currently contains a mosaic of perennial grasslands and vernal pool areas, and has been identified by local planners as having great potential for ecological benefits from restoration. ERP will therefore seek to protect existing habitat areas, and to secure land and easement interests from willing landowners to enhance these resources.

III. Stressors

Restoration of ecosystem processes to help improve the quality and extent of desirable habitats is only part of the solution to species recovery in the Delta. The ERP identified several stressors that negatively affect the Delta's ecosystem health as measured by native species, ecological processes, and habitats. The focus in this element of the Conservation Strategy for the Delta EMZ is on stressors including water diversions, barriers to connectivity of habitats (such as levees), non-native and invasive species, and water quality.

Appendix E
Excerpt from Draft Ecosystem Restoration Program's Conservation Strategy for Stage 2 Implementation for the Sacramento-San Joaquin Delta Ecological Management Zone (DFG et al. 2010): "Section III.B. Invasives"

Nobriga 2008). One criticism of using the E/I ratio to manage effects on Delta fish is that the actual volume of exports can increase substantially while maintaining the same overall E/I ratio. Better resolution of the relationship(s) between salvage and E/I ratio may be achieved if either the export or import term is held constant (NMFS 2009a). Due to their very large hydrodynamic footprint, reducing the negative effects of the SWP and CVP pumps cannot be accomplished through screening and will depend in part on the alternative conveyance chosen in the BDCP planning process.

On August 22 and September 11, 2007, the CALFED Science Program convened workshops to identify and discuss key scientific and technical issues pertaining to conveying Sacramento River water through or around the Delta to the SWP and SVP. Several important broad conclusions emerged:

- All conveyance options involve trade-offs and compromises
- Science can help select, but not choose, the "best" water conveyance alternative
- Clear objectives are critical to a thorough evaluation of conveyance alternatives
- A coastal ocean to watershed perspective is needed to effectively evaluate conveyance alternatives
- Through-Delta conveyance must be made to work effectively for decades into the future
- Adaptive management should be used in implementing any conveyance alternative
- Alternative financing must be found to fund the construction of an alternative conveyance system

III.B. Invasives

Mission of the CALFED Nonnative Invasive Species Program: Prevent establishment of additional non-native species and reduce the negative biological and economic impacts of established non-native species.

ERPP Strategic Plan, July 2000

Non-native invasive species (NIS) have produced immense ecological changes throughout the Bay-Delta ecosystem by altering food webs and habitats, competing with native species for resources, and directly predating upon native species. NIS represents one of the biggest impediments to restoring habitats and populations for native species (CALFED 2000a). NIS have been introduced into the Delta over time via several mechanisms, the most common being discharge of ships' ballast water in ports. Invasive species are also transported from one place to another on recreational boats, "planted" for recreational or other purposes (e.g. largemouth bass), or released from aquariums into the environment. In 2006, the Water Board listed the Delta, upper San Joaquin River, and Cosumnes River on its 303(d) list as impaired for exotic species and is expected to formulate a TMDL program for these waterways within the next ten years (SWRCB 2007).

The *Delta Vision Strategic Plan* that incorporated some ideas regarding the control of harmful invasive species: Strategy 3.3, "Promote viable, diverse populations of native and valued species by reducing risks of fish kills and harm from invasive species." This strategy includes actions to control harmful invasive species at existing locations and minimize or preclude new introductions and colonization of new restored areas.

Much has been learned about NIS since 2000 from activities that have occurred under ERP, as well as from other planning and monitoring efforts. ERP has funded many projects since 2000 to try to control and educate the public about the threat of invasive exotic species. Some projects included a study on the feasibility of ships exchanging their ballast water out in the ocean rather than discharging ballast water into destination ports. While other ERP projects provided outreach geared toward educating recreational boaters and anglers, and individuals involved in the aquarium trade, on the threats posed by exotic species.

As part of the CALFED NIS Program, a Strategic Plan and Implementation Plan were developed, and the Non-Native Invasive Species Advisory Council (NISAC) was established. The NISAC coordinates and implements activities and projects that address NIS issues in CALFED's area of concern, and is currently promoting an invasive species prevention approach known as Hazard Analysis and Critical Control Points (HACCP). HACCP is a planning tool that originated with the food industry, but has been modified to include natural

Potential Stage 2 Actions for Non-Native Invasive Species:

Action 1: Continue implementing the CALFED NIS Strategic Plan and DFG's California Aquatic Invasive Species Management Plan (CAISMP) to prevent new introductions; limit or eliminate NIS populations; and reduce economic, social and public health impacts of NIS infestation.

Action 2: Continue funding the Department of Boating and Waterways *Egeria densa* mapping program. Also, begin investigating whether non-chemical means of control are possible.

Action 3: Continue research and monitoring programs to increase understanding of the invasion process and the role of established NIS in the Delta's ecosystems including:

- Investigate invasions by *Egeria* or *Microcystis* to newly restored areas.
- Investigate recreating habitats that have a high variability in abiotic factors (e.g. salinity, flows, depth, etc.) as a means of limiting the overbite and Asian clams and *Egeria.*

Action 4: Continue studies on the effectiveness of local treatment of zebra and quagga mussels using soil bacterium.

Action 5: Standardize methodology for sampling programs to measure changes in NIS populations over a specific timeframe.

Action 6: Collect and analyze water quality sampling data (e.g. salinity and water temperature) for correlation analysis between NIS distribution and habitats.

Action 7: Complete an assessment of existing NIS introductions and identify those with the greatest potential for containment or eradication; this assessment also would be used to set priority control efforts.

Action 8: Establish a program to monitor for new invasions of non-native wildlife, and develop responses to quickly contain and control them.

Action 9: Continue investigating potential parasite(s) as a means to control invasive clam or mussel populations.

resource management. HACCP identifies and evaluates potential risks for introducing "non-targets", such as invasive species, chemicals, and disease, during routine activities, and focuses attention on critical control points where "non-targets" can be removed.

As a separate effort, DFG issued its California Aquatic Invasive Species Management Plan (CAISMP) in January 2008. CAISMP's focus is on coordinating the efforts of State agencies to minimize the harmful ecological, economic, and human health impacts from aquatic invasive species. CAISMP provides a common platform of background information from which State agencies and other entities can work together to address the problem of aquatic invasive species, and identifies major objectives and associated actions needed to minimize these impacts in California. Depending on the species and the level of invasion, there are different management responses that could be pursued. The CAISMP includes examples of management responses to specific invasive species in the Delta. Some of the NIS that are of highest management concern in the Delta include:

Centrarchids. The most common centrarchids in the Delta are largemouth bass, smallmouth bass, spotted bass, bluegill, warmouth, redear sunfish, green sunfish, white crappie, and black crappie. The increase in non-native SAV has provided conditions that likely assisted with increased populations of these fish (Brown and Michniuk 2007). Centrarchids, which benefit from the use of SAV, can have a large negative impact on native fish through predation and competition (Nobriga and Feyrer 2007, Brown and Michniuk 2007).

Thus, the presence and distribution of centrarchids may be manipulated by managing environmental conditions such as water velocity, salinity, turbidity, and the extent of SAV. Management actions and the resulting impacts to centrarchids are being evaluated using DRERIP conceptual models for potential site-specific restoration.

Overbite Clam. The overbite clam (*Corbula amurensis),* was first observed in 1986 and has since become extremely abundant in Suisun Bay and the western Delta (Carlton et al. 1990). This species is well adapted to the saltwater areas of the estuary and is largely responsible for the reduction of phytoplankton and some zooplankton in the Bay-Delta region (Kimmerer 2006). This loss of primary and secondary production has drastically altered the food web and is a contributing cause of the POD (IEP 2007b). Overbite clam have been shown to strongly bioaccumulate selenium (Linville et al. 2002); this could have reproductive implications for fish (e.g. sturgeon, splittail) and diving ducks that feed on overbite clam.

Asian Clam. The Asian clam (*Corbicula fluminea),* was also introduced from Asia. It was first described in the Delta in 1946 (USGS 2001). This clam does not tolerate saline water. It is now very abundant in freshwater portions of the Delta and in the main stem of rivers entering the Delta. Ecologically, this species can alter benthic substrates and compete with native freshwater mussels and clams for food and space (Claudi and Leach 2000); however, Asian clam has not historically been viewed as significantly impacting the aquatic food web.

Because overbite clam and Asian clam have become so well-established in the estuary, there is currently no known environmentally acceptable way to treat or remove these invertebrates (DFG 2008a). The only apparent management action at this time is to determine whether the manipulation of environmental variables, such as salinity, can be used to manage their distribution in the estuary during certain months of the year. There is not consensus among scientists that manipulation of salinity would do much to affect the distribution of these clams or diminish their impacts on the estuarine food web. Many experts believe that the distribution and impacts invasive clams cannot be controlled (CALFED Science Program 2008).

Zebra Mussel. The zebra mussel (*Dreissena polymorpha)* is not yet in the Delta, but it is highly invasive and could become established if introduced there. This species poses threats to the ecosystem similar to those posed by overbite clam and Asian clam. Zebra mussels typically colonize at densities greater than 30,000 individuals per square meter. One of the most predictable outcomes of a zebra mussel invasion and a significant abiotic effect is enhanced water clarity linked to a greatly diminished phytoplankton biomass. For example, rotifer abundance in western Lake Erie declined by 74% between 1988 and 1993, the same time that an enormous zebra mussel population became established in that area. [Claudi and Leach 2000]

Quagga Mussel. Threats from the quagga mussel (*Dreissena bugensis)* are thought to be similar to those of the zebra mussel (Claudi and Leach 2000). Quagga and zebra mussels have very similar life history strategies, with the exception that quagga can live at greater depths (Claudi and Leach 2000). An interagency state and federal coordination team was established to coordinate management responses to the threat of further quagga spread in California. Three subcommittees were established: Outreach and Education, Monitoring, and Sampling/Laboratory Protocols. The quagga mussel scientific advisory panel, convened in April 2007, was charged with considering the full range of eradication and control options without respect to cost. Under the direction of DFG, the San Francisco Estuary Institute is performing a phased risk assessment of California waters in order to rank sites for further monitoring based on the likelihood that quagga or zebra mussels will become established.

There are a couple of relatively recent developments with respect to controlling both zebra and quagga mussels. A common soil bacterium, *Pseudomonas fluorescens*, has proven to be very effective in controlling populations, with a 95% kill rate at treatment sites. The bacterium produces a toxin which destroys the invasive mussels' digestive gland, killing them. Research has indicated that the bacterium does not harm untargeted native fish and mussel species (Science Daily 2007). Also, research is showing that a potassium salt solution may be an effective measure to control relatively localized and isolated infestations. It is possible that these control methods could be used to control zebra and quagga mussel populations, but they should be tested in small, isolated experiments.

Zooplankton. An extensive set of monitoring data from the IEP continues to show how introduced zooplankton species have become important elements of the Bay-Delta.

Eurytemora affinis was probably introduced with striped bass around 1880. Until recently, it was a dominant calanoid copepod in the estuary. In the last decade, however, *Eurytemora* has been replaced by two calanoid copepods introduced from China. It has been postulated that this replacement was a result, in part, of *Eurytemora*'s greater vulnerability to overbite clam grazing (Bouley and Kimmerer 2006).

Populations of the native mysid shrimp *Neomysis mercedis*, another form of zooplankton, began dwindling in the late 1970s. Its population decline was affected by competition with the smaller *Acanthomysis aspera*, an introduced mysid shrimp with similar feeding habits. The decline of the native shrimp species has been identified by the POD work team as one possible cause for the food web decline in the Delta (2007b). Synthesis of IEP's extensive modeling data could help assess trends in rates of invasion and different invasive species' populations.

Plants. Non-native aquatic weeds in the Delta pose serious problems to native flora and fauna. Research, monitoring, mapping, and control are needed for *Egeria densa*, water pennywort, Eurasian watermilfoil, parrot feather, and water hyacinth. These weeds flourish in a wide geographic area, sometimes in high densities, and are extremely harmful because of their ability to displace native plant species, harbor non-native predatory species, reduce food web productivity, reduce turbidity, or interfere with water conveyance and flood control systems. Areas with large densities of SAV have been implicated in reduced native fish larvae and adults (Grimaldo et al. 2004, Nobriga et al. 2005, Brown and Michniuk 2007). Restoration of habitats in intertidal areas must be designed and managed to reduce non-native SAV if conservation goals are to be met (Nobriga and Feyrer 2007).

The California Department of Boating and Waterways (CDBW) is the lead agency for the survey and control of *Egeria densa* and water hyacinth in the Delta. CDBW's control programs use two tools to determine coverage and biomass of these aquatic weeds: hyperspectral analysis and hydroaccoustic measurements. This technology has aided in the assessment of *Egeria densa* coverage and biovolume, which in turn was instrumental in evaluating the effectiveness of mechanical and chemical treatment; a key asset of the technology is that it yields a very rapid, verifiable characterization of the entire water column beneath the transducer (Ruch and Kurt 2006). While this technology has been helpful in controlling localized patches of SAV, ongoing efforts of CDBW's control program may not be successful over time because other aquatic weeds (such as Eurasian watermilfoil or curlyleaf pondweed) may replace *Egeria densa*. Both of these plants have different growth properties that may require different control techniques than those employed in the current control program (CDBW 2006).

Other non-native plants that have been the focus of ERP NIS-related activities include the control of *Arundo donax*, tamarisk, and purple loosestrife in terrestrial areas. Grazing of perennial grasslands has helped control the spread of some invasive weeds in some areas (Stromberg et al. 2007).

As mentioned earlier, NIS have become particularly problematic in the Delta as its management has reduced the historic variability in which native species evolved, in the

interest of maintaining a common freshwater pool for water export and in-Delta agricultural use. It is hypothesized that periodic salinity intrusion into the Delta may help to reduce the abundance and/or distribution of certain harmful invasive species, and give native species a competitive advantage. The Pelagic Fish Action Plan (IEP 2007b) suggests the following actions to address invasive aquatic species in the estuary:

- Support California State Lands Commission's (CSLC) work to control ballast water, including DFG oversight of studies to determine the location and geographic range of NIS in the estuary and assessment of ballast water controls
- Assist CSLC, DFG, and others in the development of regulations or control measures for hull-fouling
- Support implementation of the CAISMP

III.C Water Quality Stressors

The Bay-Delta ecosystem receives a large variety of potentially toxic chemicals, including but not limited to pesticides from agricultural and urban runoff, contaminants discharged from wastewater treatment plants, mercury from gold mining and refining activities, selenium from agricultural practices, and other metals from different mining activities. Scientists must consider the synergistic effects of multiple contaminants when looking at environmental water quality. In addition, stressors such as high water temperatures and low dissolved oxygen levels threaten habitat suitability for a wide range of species.

There were two strategies in the *Delta Vision Strategic Plan* that incorporated ideas for improving environmental water quality in the Delta: Strategy 3.2, "Establish migratory corridors for fish, birds, and other animals along selected Delta river channels"; and Strategy 3.5, "Improve water quality to meet drinking water, agriculture, and ecosystem long-term goals." These strategies include actions to improve fish migration corridors, control contaminants from urban runoff, discharges from wastewater treatment plants and irrigated agriculture, and establishing or implementing TMDL programs for mercury, selenium, and low dissolved oxygen.

Water Temperature. Water temperature is a key factor in habitat suitability for aquatic organisms. Unnaturally high water temperature is a stressor for many aquatic organisms, particularly because warm water contains less dissolved oxygen. Lower water temperatures can also hinder growth and distribution of some non-native species, thus reducing their predation, and competition for food and habitat with native species. Major factors that increase water temperature and negatively impact the health of the Delta are disruption of historical streamflow patterns, loss of riparian vegetation, reduced flows releases from reservoirs, and discharges from agricultural drains.

It may be difficult to manage water temperatures in the Delta, because Delta water temperatures are driven mainly by ambient air temperature. With expected localized warming of air temperatures due to regional climate change, particularly in summer, the problem of maintaining sufficiently low water temperatures in the Delta to sustain native

Appendix F
Funding Sources

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Appendix D: Funding Sources

This section describes some potential funding sources that could be part of a financing strategy. In developing the financing strategy, the approaches used by other major programs around the country were explored. Some of the more innovative approaches are described here.

Capital Funding Sources

To implement the Delta Plan infrastructure improvements, and for financing habitat acquisitions and improvements, capital funding sources will need to be identified. Capital funding sources may include federal appropriations, State General Fund appropriations, State-issued debt, local debt, and private funding.

Federal Appropriations

Federal appropriations pay for the taxpayers' share of capital costs and require the approval of Congress. Federal authorization already exists for several Delta programs, and the challenge will be for Congress to appropriate funds annually. Similar to the State's financial condition, there are increasing demands from all sectors of the federal budget, which makes obtaining federal funding more difficult.

General Fund Appropriations

General Fund appropriations may pay for the taxpayer share of capital and operating costs and may be used for any purpose. However, the State's fiscal condition will limit their availability in the future.

State-issued Debt

The State traditionally has issued two types of debt for water related infrastructure: general obligation bonds and revenue bonds. General obligation bonds must be approved by voters, and their repayment is guaranteed by the State's general taxing power, resulting in typically low interest costs. Revenue bonds do not require voter approval because they are secured by a designated revenue stream, such as water sales. Revenue bonds may be a preferred mechanism.

Local Government Debt

Construction expenditures might be funded by debt issued by local governments or water agencies. Depending on the type of project being financed, local entities may be able to issue debt based on their increased revenue streams or may be able to establish some type of improvement or assessment district.

Conservation Organizations

A variety of conservation organizations provide funds for land and water acquisition and management. The Nature Conservancy, for example, has been active in the region. Nonprofit (501(c) (3)) organizations could be created to accept tax-deductible gifts that could be operated for Delta projects and programs.

Repayment and Operations and Maintenance Funding Sources

A Finance Plan requires identifying revenue sources to repay capital costs and to pay for ongoing operations, maintenance, and replacement costs.

User Charges for Water

Most water agencies generate the bulk of their revenue by selling water. Water sale revenues are normally used to recover water supply and quality costs, including operations and maintenance expenses and debt repayment for infrastructure investments in facilities. The cost of developing new water supplies is usually factored into the price for all water supplies. However, surface water sale revenues are limited by the elasticity of demand. If demand is at all elastic (price responsive), then water users will take less water as price increases (or shift to groundwater if available), and water revenues may fall below expectations. Funding very large investments in new water supplies may exceed the capacity of current users given the economic returns they receive for water. This result is a common feature of markets. Allowing reallocation of resources among users may be required for the long-term economic vitality of the State (allowing water to go the highest use value).

Fines and Forfeitures

Significant dollars are raised annually as the result of administrative and civil enforcement actions. Water Code section 13260 provides that the State Water Resources Control Board (SWRCB) can collect fees to deposit in the Waste Discharge Permit Fund. For fiscal year 2008–2009, revenues and expenditures were about $80 million. Most expenditure is for National Pollutant Discharge Elimination System permit and stormwater programs, and for waste discharge requirements. Within these programs, most costs are for permitting, enforcement, and compliance (SWRCB 2009). The Council should research the potential for assigning fees, fines, and forfeitures generated from actions detrimental to the Delta directed to Delta activities.

Reallocating Funds

Given the number of agencies involved with Delta operations, funds might be generated by reallocating dollars among agencies.

Cost Efficiencies

Water supply and quality improvements, improved ecosystem health, and levee improvements may result in verifiable cost savings. In general, such cost savings represent a potential source of funding for the Delta Plan. Additional studies are needed to determine whose costs and how much cost might be saved.

Carbon Offsets/Tule Farming

Carbon markets are increasingly accepted by State and federal authorities and private markets as a means to offset carbon emissions. A seller can develop carbon offsets to be sold on the market. The offset can be developed based either on sequestration or reduction of greenhouse gas emissions. The cost of an offset has recently ranged from $8 to $30 per ton-year (California Chapter American Society of Farm Managers and Rural Appraisers 2009).

Conversion of farmed Delta islands with peat soils to natural wetlands or water bodies could provide two types of offsets. The Delta subsides at a rate of 1 to 3 inches a year, mostly in the form of carbon dioxide releases (Ingebritsen et al. 2000). In the Delta Wetlands Project 2010 Draft Place of Use EIR, it was estimated that the amount of carbon dioxide emissions from farmed Delta islands is 17 tons per acre per year (Semitropic Water Storage District 2010).

When the land is converted to cattails or tules, this loss is stopped. Dead plant material, largely carbon, accumulates in the form of new peat soil. The U.S. Geological Survey has been measuring carbon sequestration on an experimental plot on Twitchell Island for about 15 years. The additional carbon dioxide sequestered by cattails or tules amounts to another 12 to 20 tons per acre per year using high and low ranges, and potential revenue per acre is $100 to $800 per acre per year. It appears that carbon dioxide offsets might repay a significant share of Delta island acquisition and wetland restoration costs. Net revenue of $200 per acre per year is worth about $3,000 to $4,000 per acre in net present value terms as compared to the cost of land, which may be $3,000 to $10,000 per acre (California Chapter American Society of Farm Managers and Rural Appraisers 2009).

User Fees and Stressor Fees

User fees and stressor fees are conceptually similar but somewhat different. User fees may be assessed because the user benefits from improvements funded by the fee. Stressor fees are justified because fee revenues are used to reduce unwanted stressors, and because the fees provide incentive to reduce stressors. User fees are collected based on amount of a resource used. Stressor fees are collected based on the amount of stressor released or caused. In either case, physical measurement of the amount of use or stressor is required.

Diversion Fees

Diversion fees are commonly assessed based on both use and stress. That is, diversions may benefit from expenditures, but they may also contribute to stress.

A number of factors limit the feasibility of additional diversion fees in California. In particular, water users adamantly oppose any new diversion fees, unless perhaps the fees are developed by water users themselves. In 2005, for example, a letter from 39 water district and city managers to Governor Schwarzenegger included the following request (Senator Perata et al. 2005):

> *…do not include CALFED user fees as part of the 2005-06 state budget. Any such proposal is entirely inappropriate, given that all versions of the CALFED needs assessment aired to date have avoided grappling directly with the "beneficiary pays" principle. CALFED cost allocations should be proposed only after CALFED has conducted an open public hearing process in which all stakeholders have had the opportunity to present testimony on appropriate beneficiary payments. Until this process has been completed, no financing plan for CALFED can be considered complete and ready for implementation as part of the state budget.*

Existing laws, such as Proposition 218, limit the ability of any State or local government to establish new diversion fees. Enabling legislation would be required.

The potential for diversion fees is also limited by the inconsistency and lack of water diversion measurement in some places. Diversions are measured by a variety of methods, and some diversions are not routinely measured. The costs of standardized measurement could be significant relative to the amount of fees collected.

Several efforts in the past estimated the fees that could be collected if the fees were similar to Bureau of Reclamation restoration fees. In 2000, one author estimated that average non-CVP contract diversions of 13.182 million acre-feet with fee levels similar to CVP restoration fees could provide about $105 million in annual revenues (Wahl 2000). In 2004, CALFED estimated that potential fee levels per acre-foot-year of diversion would raise $25 million in annual funds based on "normal" non-CVP contract diversions of 16.522 million acre-feet. These fee levels were $1.50 for all users, or $1.25 for agriculture and $2.50 for urban users, or $3.25 for Delta exporters and $1 for all others (CALFED 2004). CALFED also estimated

that a residential fee of $1 per month per household in the CALFED solution area could raise $106 million annually.

Fishing Fees and Payments

From 2004 through 2009, recreational fishing within the Bay-Delta watershed below the first dam required a Bay-Delta Sport Fishing Enhancement Stamp. In 2009, about 300,000 stamps were sold at a retail cost of $6.30, and gross revenues were about $1.9 million. These funds were used to leverage a 75 percent cost share from the federal Sport Fish Restoration Act. In 2009, Assembly Bill 1052 repealed the stamp (California Department of Fish and Game 2011a). The Council should consider supporting legislation to renew this funding source.

A stressors-based finance charge would collect fees based on removals of desirable species. In 2011, inland steelhead anglers are required to purchase a Steelhead Report Card at a cost of $6.48, and a North Coast Salmon Report Card costing $5.66 is required for all anglers taking salmon in the Smith River System or Klamath-Trinity River System (California Department of Fish and Game 2011b). Annual revenues from 2001 to 2006 from the steelhead card averaged about $200,000 (Jackson 2007). Any person fishing commercially for salmon in California must purchase a commercial fishing salmon stamp for $85. Similar fees might be collected when substantial salmon fishing is again allowed in the Bay-Delta system. In 2006, about 500,000 freshwater and 1 million saltwater days were taken for salmon fishing (California Department of Fish and Game 2010). Revenue potential from recreational salmon cards is perhaps $500,000 to $1 million annually.

Hydropower Fees

Fees could be collected from hydropower generators in the Bay-Delta system. The SWRCB collects fees of $0.017 per kilowatt capacity from licensed Federal Energy Regulatory Commission projects, and higher fees are collected from facilities that recently renewed their Federal Energy Regulatory Commission licenses (SWRCB 2010). These fees must be used to cover authorized costs of the Water Rights Program. The potential for additional revenues from hydropower generators is unknown.

Other Stressor Fees

A variety of stressor fees might be used to help finance programs within the Delta Plan. Seven types of stressor fees have been considered:

1. Water quality loading charge: charge measured pollutant loads in water discharges.
2. Land use charge: charge land use practices that contribute to stressors.
3. Retail sales fees: charge retail sales of products that may become stressors.
4. Habitat alteration fees: charge existing or proposed land alterations that contribute to habitat stressors.
5. Special diversion fees: charge water diversions that contribute more than average to entrainment, stranding, or flow-related habitat loss.
6. Recreation use fees: charge for recreation that contributes to stressors.
7. Hatchery fees: charge hatcheries for management practices that damage Delta resources.

Of these seven stressor-based fees, the water quality loading charge appears to be relatively most feasible. The “polluter pays” principle is well established in law. Many waste dischargers already pay fees that are set by the SWRCB and deposited into the Waste Discharge Permit Fund. For fiscal year 2008–2009, revenues were about $80 million.

Most of the loads of some pollutants (ammonia and certain chemicals in particular) come from known discharges where the amount of load can be measured. The cost of removing the stressors by another means may determine a fair and efficient charge level. There are important measurement and administrative costs, but these could be small compared to revenues.

The other stressor-based fees are generally not as straightforward. For land use charges, a fee for land management practices that release methylmercury, for example, the stressor being introduced is often diffuse, not well measured, and the amount may vary substantially based on location and local conditions. It may be unfair or expensive to set land use changes based on diffuse and hard-to-measure stressors. Proposition 218 procedures must be applied for stormwater fees, so they would likely apply to land use charges as well.

A charge on retail sales of stressor materials such as pesticides or fertilizers might also be problematic because materials are used in a wide variety of locations and situations. The legal feasibility of such charges is not clear.

There is good potential to establish charges for some types of habitat alteration practices, such as wetland conversions. However, such charges might fall under Proposition 218. The special diversion charge would be difficult to justify because the amount of unusual damage via entrainment, stranding, or flow habitat loss would often be difficult to quantify and value. Hatchery management fees might be inefficient compared to other efforts to improve hatchery practices.

The revenue potential from stressors fees is unknown, but not believed to be large. Also, it is likely that any stressor fees could be spent only for a very limited range of activities that would benefit the persons paying the fee. There is some potential for revenues in the form of fishing stamps (probably less than $5 million annually) and additional water quality loading charges.

Water Marketing Fees

Water marketing fees would be applied to water transfers in the Delta watershed. These fees would be above and beyond any existing watershed diversion or export fees. The SWRCB currently collects fees associated with change in water rights required for transfers.

The number of water transfers that occur between existing water agencies is not large compared to total statewide water use. During the drought years of 2008 and 2009, about 400,000 acre-feet of cross-Delta transfers were reported annually.[1] If such transfers paid a fee of $10 per acre-foot, revenues might be $4 million annually. However, the volume of transfers in most years would be much less than in 2008 and 2009.

Public Goods Charges

In 1996 a public goods charge for electricity sold by CPUC-regulated for-profit public utilities was approved in California as part of the energy sector deregulation. The public goods charge is a fee applied to a utility bill to fund public-interest programs related to utility services. More recently, interest in a public-goods charge for water has increased as a potential tool for achieving the objectives of Assembly Bill 32, known as "The Global Warming Solutions Act of 2006." (Griffin, Leventis, and McDonald 2010). In a study prepared for the California Public Utilities Commission by the U.C. Berkeley Goldman School of Public Policy, a public goods charge for water was proposed that consisted of a volumetric charge on individual water utility bills.

While the design of a public-goods charge for water would need to be developed, given the passage of Proposition 26, a two-thirds vote would be required to implement it. The primary purpose of a public-

[1] *Water Strategist*, February 2009 issue provides 2008 summary (Smith 2009).

goods charge should be to fund investments or activities that have broad, statewide benefit. These might include statewide planning, ecosystem enhancements, or investments that reduce reliance on imported supplies. A public-goods charge could ensure a minimum investment by all urban and agricultural water agencies in water user efficiency and other tools that can reduce reliance on imported water. It could also provide consistent funding over time. Actual activities to be funded would need to be more definitely described before it could be presented to the voters.

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